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Filed on behalf of PalTalk Holdings, Inc.
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

RIOT GAMES, INC. and
VALVE CORP.
Petitioners

v.

PALTALK HOLDINGS, INC.,
Patent Owner

Case IPR2018-00129[1]
Patents 5,822,523 & 5,822,523 C1

PATENT OWNER'S NOTICE OF APPEAL TO THE U.S. COURT OF APPEALS FOR THE FEDERAL CIRCUIT

[1] Case IPR2018-01242 has been joined with this proceeding.

Pursuant to 28 U.S.C. § 1295(a)(4)(A), 35 U.S.C. §§ 141(c), 142, and 319, 37 C.F.R. §§ 90.2(a) and 90.3, and Rule 4(a) of the Federal Rules of Appellate Procedure, Patent Owner PalTalk Holdings, Inc. ("PalTalk") hereby appeals to the United States Court of Appeals for the Federal Circuit from the Final Written Decision (Paper 37) entered on May 14, 2019 (attached hereto as Attachment A), and from all underlying orders, decisions, rulings, and opinions that are adverse to PalTalk related thereto and included therein.

In particular, PalTalk identifies the following issues on appeal: the determination that Claims 1-10, 16-18, and 31-47 of U.S. Patent Nos. 5,822,523 and 5,822,523 C1 are unpatentable under 35 U.S.C. § 103, any finding or determination supporting or relating to these issues; and all other procedural and substantive issues decided adversely to PalTalk in any order, decision, ruling, or opinion by the Board in both IPR2018-00129 and IPR2018-01242.

PalTalk is concurrently providing true and correct copies of this Notice of Appeal, along with the required fees, with the Director of the United States Patent and Trademark Office and the Clerk of the United States Court of Appeals for the Federal Circuit.

ARMOND WILSON LLP

June 12, 2019

/Douglas R. Wilson/
Douglas R. Wilson (Reg. No. 54,542)

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PALTALK HOLDINGS, INC.

ATTACHMENT A

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Tel: 571-272-7822
Paper 37
Entered: May 14, 2019

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

RIOT GAMES, INC.,
Petitioner,

v.

PALTALK HOLDINGS, INC.,
Patent Owner.

Case IPR2018-00129[1]
Patent 5,822,523 & 5,822,523 C1[2]

Before THU A. DANG, KARL D. EASTHOM, and NEIL T. POWELL
Administrative Patent Judges.

EASTHOM, *Administrative Patent Judge*.

DECISION
Final Written Decision
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

[1] The panel joined Petitioner Valve Corp. and Case IPR2018-01242 to the instant proceeding. *See* Paper 34.

[2] The Petition challenges original claims and claims issued pursuant to an *ex parte* reexamination certificate. *See* Ex. 1001.

I. INTRODUCTION

A. Background

Riot Games, Inc. ("Petitioner") filed a Petition requesting an *inter partes* review of claims 1–10, 16–18, and 31–47 of U.S. Patent Nos. 5,822,523 and 5,822,523 C1 (Ex. 1001, the "'523 patent"). Paper 1 ("Pet."). PalTalk Holdings, Inc. ("Patent Owner") filed a Preliminary Response. Paper 6 ("Prelim. Resp."). Pursuant to our authorization (Paper 8, "Order"), Petitioner filed a Reply to Patent Owner Preliminary Response (Paper 9, "Pet. Prelim. Reply") addressing Patent Owner's claim constructions, and Patent Owner filed a Preliminary Sur-Reply (Paper 10, "PO Prelim. Sur-Reply").

After we instituted trial on challenged claims 1–10, 16–18, and 31–47 (Paper 11, "Institution Decision" or "Inst. Dec."), Patent Owner filed a Response (Paper 22, "PO Resp."), Petitioner filed a Reply to Patent Owner's Response (Paper 25, "Reply"), and Patent Owner filed a Sur-Reply to Petitioner's Reply (Paper 30, "Sur-Reply"). An Oral Hearing transpired on February 13, 2019. The record includes a transcript of the Oral Hearing Paper 36 ("Tr.").

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision issues under 35 U.S.C. § 318(a). For the reasons discussed below, Petitioner has demonstrated by a preponderance of the evidence that claims 1–10, 16–18, and 31–47 of the '523 patent are unpatentable under 35 U.S.C. § 103(a).

B. Related Proceedings

Petitioner states that the '523 patent relates to the U.S. Patent Nos. 6,226,686 (the "'686 patent") and 6,018,766. Pet. 1. Also, *ex partes* reexamination No. 90/011,036 (Ex. 1006) involved a reexamination of the ’686 patent. Pet. 1. A concurrent request for *inter partes* review, IPR2018-00130, challenges claims of the ’523 patent. Pet. 1. Two other concurrent requests for *inter partes* reviews, IPR2018-00131 and IPR2018-00132, involve challenges to claims of the ’686 patent. Pet. 1. Petitioner also states that the following cases involve the ’523 and ’686 patents: *PalTalk Holdings, Inc. v. Valve Corp.*, No. 16-cv-1239-JFB-SRF (D. Del.) (filed Dec. 16, 2016); *PalTalk Holdings, Inc. v. Riot Games, Inc.*, No. 1:16-cv-1240-JFB-SRF (D. Del.) (filed Dec. 16, 2016); *PalTalk Holdings, Inc. v. Sony Computer Entertainment America, Inc.*, No. 2:09-cv-00274-DF-CE (E.D. Tex.) (filed Sept. 14, 2009); *PalTalk Holdings, Inc. v. Microsoft Corp.*, Case No. 2:06-cv-00367-DF (E.D. Tex.) (filed Sept. 12, 2006); and *Mpath Interactive v. Lipstream Networks, Inc.*, No. 3:99-cv-04506-WHA (N.D. Cal.) (filed Oct. 7, 1999). Pet. 1–2.

C. The ’523 Patent

The ’523 patent describes a “group messaging server” and a “method for deploying interactive applications over a network containing host computers and group messaging servers.” Ex. 1001, [57]. Figure 5, reproduced below, illustrates a unicast network over which the interactive applications may be deployed.

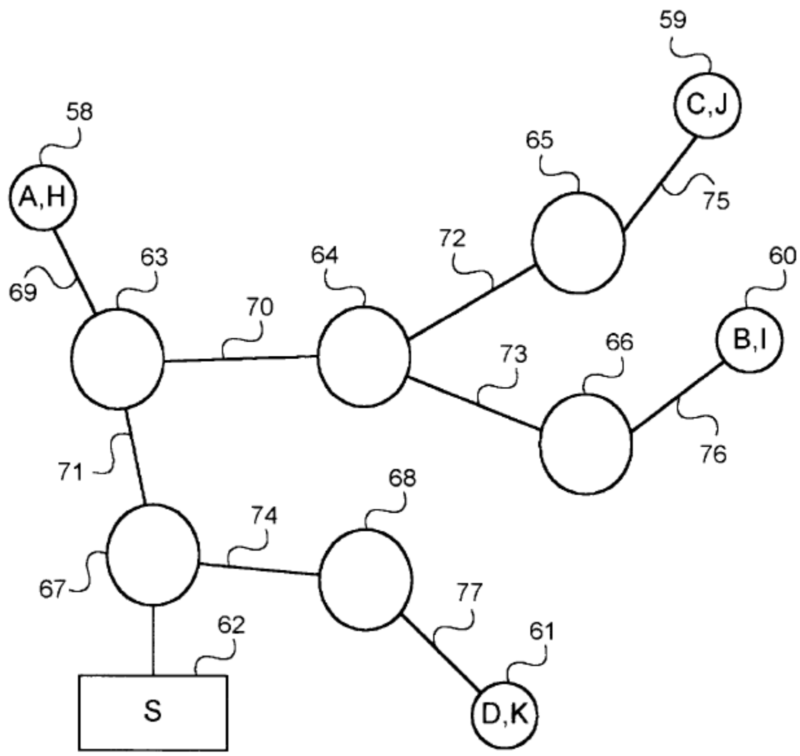


Figure 5

Figure 5 depicts a wide area network with hosts 58, 59, 60, and 61, and a group messaging server ("GMS") 62. *Id.* at 8:61–9:1. Host 58 has Transport Level Protocol (TLP) address A and Upper Level Protocol (ULP) address H. *Id.* at 8:62–63. Host 59 has TLP address C and ULP address J, host 60 has TLP address B and ULP address I, and host 61 has TLP address D and ULP address K. *Id.* at 8:63–65. GMS 62 has TLP address S. *Id.* at 9:10. The conventional unicast network includes network links 69, 70, 71, 72, 73, 74, 75, 76, and 77, and unicast routers 63, 64, 65, 66, 67, and 68. *Id.* at 8:65–9:1. GMS "62 receives messages from the hosts addressed to a message group and send[s] the contents of the messages to the members of the message group." *Id*. at 9:1–4.

Figure 7, reproduced below, depicts ULP datagrams with payload aggregations for implementing an interactive gaming application between the four hosts in Figure 5.

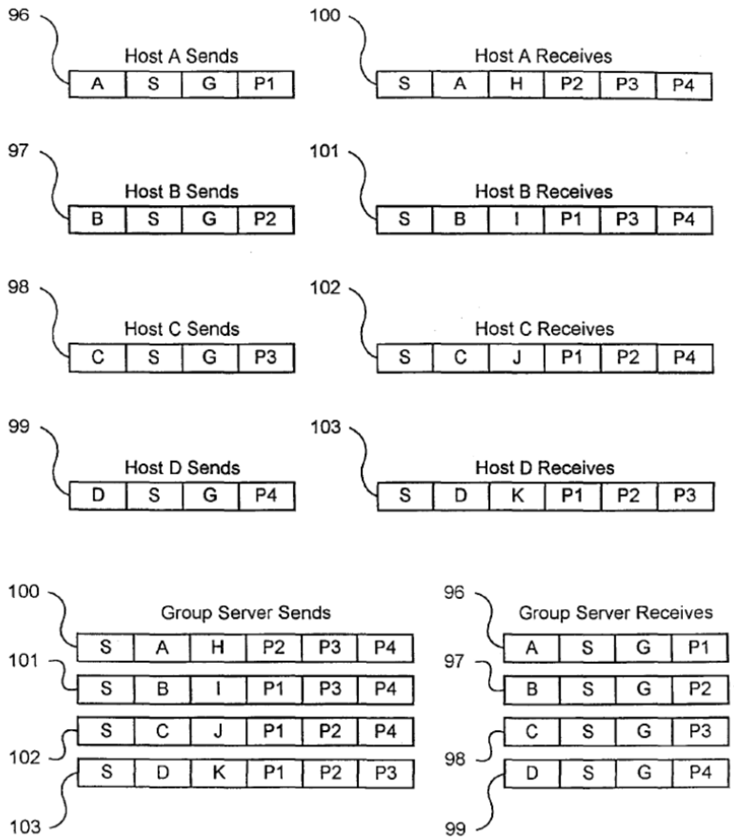


Figure 7

Figure 7 shows GMS (group messaging server) 62 receiving multiple messages 96, 97, 98, and 99 before sending them to hosts within message group G. *Id.* at 9:18–20, 10:24–28. As shown in Figure 7, multiple messages 96, 97, 98, and 99, each respectively contain payload P1, P2, P3, and P4, three of which GMS aggregates into a single larger message, 100, 101, 102, or 103. *Id.* Prior to aggregation, host 58 sends message 96 (shown in Figure 7 as "Host A sends"), host 60 sends message 97, host 59 sends message 98, and host 61 sends message 99, wherein each of the messages from the hosts has destination TLP address S and ULP address G for GMS 62. *Id.* at 10:28–32. After GMS 62 receives all four of these messages, it creates four outbound messages 100, 101, 102, and 103. *Id.* at 10:29–30. Aggregated message 100 includes source TLP address S and destination TLP address A as header information encapsulating ULP address H for host 58 and aggregated payload P2, P3, and P4, respectively, from the messages from hosts 59, 60, and 61. *See id*. at 10:34–36, 13:59–66, 17:19–21. In a similar manner, aggregated message 101 targets host 60, aggregated message 102 targets host 59, and aggregated message 103 targets host 61. *Id.* at 10:36–37.

Figure 9, reproduced below, depicts a datagram format and address format for ULP messages.

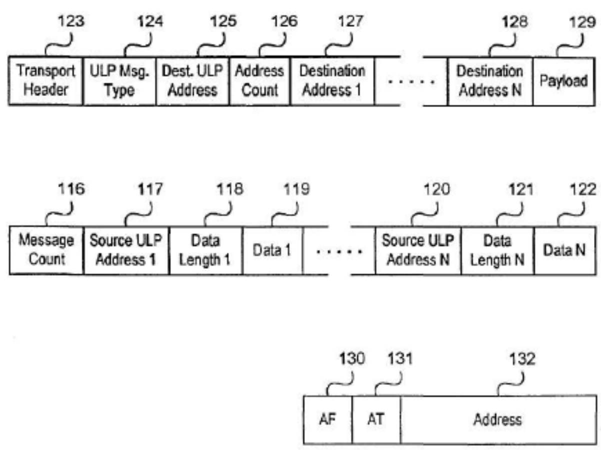


Figure 9

Figure 9 shows a ULP datagram message comprising elements 123, 124, 125, 126, 127, 128, and 129. *Id.* at 13:62–64. Transport datagram TLP header 123 encapsulates the ULP datagram that includes ULP message type field 124, destination ULP address 125, address count field 126, auxiliary destination address 127 and 128, and finally payload 129. *Id.* at 13:59–14:36. Items 116, 117, 118, 119, 120, 121, and 122 define the payload format of the ULP datagram. *Id.* at 14:37–40. Item 116 specifies the message count and defines the number of payload elements contained in the pay load. *Id.* at 14:38–40. Items 117, 118, and 119 comprise the first payload element in the payload, and items 120, 121, and 122 comprise the last payload element in the payload. *Id.* at 14:42–47. In particular, item 117 specifies the ULP address of the source of the first payload element, item 118 specifies the data length for the data in the first payload element, and item 119 constitutes the actual data. *Id.* at 14:43–46. Similarly, item 120 specifies the ULP address of the source of the last payload element N, item 121 specifies the data length for the data in the last payload element N, and item 122 constitutes the actual data. *See id.* at 14:46–47.

The '523 patent refers to "TLP such as IP (where the message header contain the source and destination TLP addresses)," with the message including "destination ULP address G." *Id*. at 9:5–11. As indicated above, the '523 patent refers to payloads that contain data and addresses: "payload P2 contain[s] data and source ULP address I," and "payload P3 contain[s] data and source ULP address J." *Id*. at 9:16–19.

D. Challenged Claim 1

Claim 1, the sole independent challenged claim, follows:

> 1. A method for providing group messages to a plurality of host computers connected over a unicast wide area communication network, comprising the steps of:
>
> providing a group messaging server coupled to said network, said server communicating with said plurality of host computers using said unicast network and maintaining a list of message groups, each message group containing at least one host computer;

> sending, by a plurality of host computers belonging to a first message group, messages to said server via said unicast network, said messages containing a payload portion and a portion for identifying said first message group;
>
> aggregating, by said server in a time interval determined in accordance with a predefined criterion, said payload portions of said messages to create an aggregated payload;
>
> forming an aggregated message using said aggregated payload; and
>
> transmitting, by said server via said unicast network, said aggregated message to a recipient host computer belonging to said first message group.

E. Instituted Grounds of Unpatentability

Petitioner contends that the challenged claims are unpatentable for obviousness under § 103 based on the following grounds (Pet. 3):

References	**Claims Challenged**
Aldred[3] and RFC 1692[4]	1–10, 16–18, 31–37, 41, 42, and 44–47
Aldred, RFC 1692, and RFC 1459[5]	38–40
Aldred, RFC 1692, and Denzer[6]	43

[3] WO 94/11814 (May 26, 1994) (Ex. 1009).

[4] Request for Comments (RFC) 1692 (Aug. 1994) (Ex. 1010).

[5] Request for Comments (RFC) 1459 (May 1993) (Ex. 1025).

[6] U.S. Patent No. 5,307,413 (issued Apr. 26, 1994) (Ex. 1014).

Petitioner also relies on the testimony of Dr. Steve R. White (Ex. 1007; Ex. 1053). Patent Owner relies on the testimony of Dr. Kevin C. Almeroth (Ex. 2002).

II. ANALYSIS

A. Level of Skill

Relying on the declaration of Dr. White, Petitioner asserts that a person of ordinary skill in the art at the time of the invention would have had "at least a master's degree (or equivalent course work) in computer science, computer engineering, or physics, and at least two years' experience in networking interactive applications," or "at least a bachelor's degree in computer science, computer engineering, or physics, and approximately four years' experience in networking interactive applications, or the equivalent, which would include experience in network programming." Pet. 4 (citing Ex. 1007 ¶¶ 42–43). Patent Owner does not assess the level of ordinary skill in the art.

We adopt the Petitioner's and Dr. White's assessment of the level of ordinary skill in the art as consistent with the '523 patent and the asserted prior art, and apply it to our obviousness evaluation below. The prior art of record reflects the level of ordinary skill in the art. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995); *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978).

B. Claim Construction

The parties agree that the '523 patent expired. Pet. 5; PO Resp. 1. Accordingly, we construe the challenged claims as they would be construed in district court. *See* 37 C.F.R. § 42.100(b) (2017) (permitting a "district court-type claim construction approach . . . if a party certifies that the involved patent will expire within 18 months from the entry of the Notice of Filing Date Accorded to Petition”).

In district court, claim terms carry their plain and ordinary meaning as would be understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc). “There are only two exceptions to this general rule: 1) when a patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution.” *Thorner v. Sony Comput. Entm’t Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012). Only terms in controversy must be construed and only to the extent necessary to resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999); *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (applying *Vivid Techs*. in the context of an inter partes review).

Petitioner notes Patent Owner “advanced several constructions for the claim elements” in prior district court litigation. *See* Pet. 5–6. Petitioner contends the “precise scope” of the terms need not be determined, provided the terms track “any interpretation consistent with their plain and ordinary meaning in the context of the [’]523 [p]atent.” *Id.* at 6.

After determining via a teleconference with the parties that with respect to three claim terms, Patent Owner’s proposed constructions in its Preliminary Response differed from what Patent Owner initially provided in prior district court litigation, we authorized the filing of a Preliminary Reply by Petitioner and a Sur-Reply by Patent Owner to address three terms: “aggregated payload,” “aggregated message,” and “payload portion.” Paper

8. In its Patent Owner Response, Patent Owner maintains the constructions it proposed in its Preliminary Response. As discussed below and as set forth in the Institution Decision, the construction of the three terms involves the overlapping issue of a transport layer header.[7]

1. "aggregated payload"

The Petition contends the term "aggregated payload," as recited in claim 1, should carry its plain and ordinary meaning consistent with the '523 patent. *See* Pet. 5–6. According to Petitioner, an "aggregated payload" should be construed as "[a] collection of two or more data items." *See* Pet. Prelim. Reply 1; Reply 11–12. Patent Owner contends "aggregated payload" should be construed as "[a] collection of two or more data items *that does not include transport layer headers*." PO Resp. 13 (emphasis added). To support its construction, Patent Owner relies on a disclosed embodiment, contending

> payload portions of messages, such as the messages 96, 97, 98, and 99 in FIG. 7, received by the group messaging server have TLP headers removed and are aggregated into an aggregated payload. The 14 aggregated payload is included in a single aggregated message with a single transport layer message header. As explained above in Section II.A., the specification of the '523 Patent describes that transport layer headers are removed from messages sent to the group messaging server.

Id. at 13–14 (citing Ex. 1001, 20:14–30; Ex. 2002 ¶ 56).

[7] The parties do not challenge our initial claim construction of the term "group messaging server" as recited in claim 1. *See* Inst. Dec. 17–18. For the reasons set forth in the Institution Decision, we construe a GMS as "a server or general purpose computer system that provides group messaging capability." *See id.*

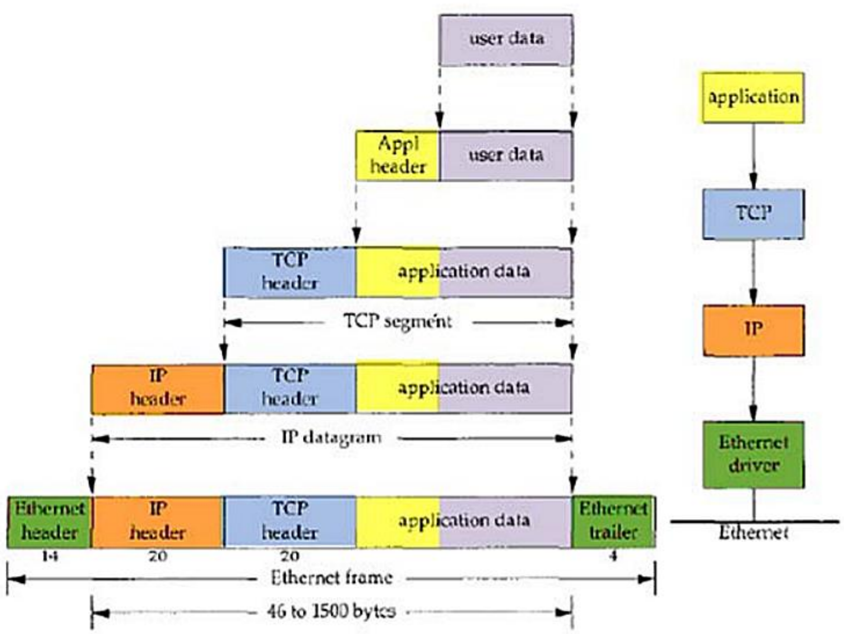
As noted above, Petitioner contends that "aggregated payload" should be construed as "[a] collection of two or more data items." *See* Pet. Prelim. Reply 1; Reply 11–12. Petitioner notes that in prior litigation, Patent Owner submitted a construction for "aggregating . . . said payload portions" without submitting the negative limitation regarding the "transport layer header" requirements. *See* Pet. Prelim. Reply 2 (citing Ex. 1016, 93, 121–22). Petitioner contends these "prior positions" undermine Patent Owner's position in this proceeding. *See id.*; Reply 13 (asserting Patent Owner's "district court construction of '*aggregating/aggregated*' . . . includes no 'transport layer header' requirement" (citing Ex. 1055, 2–3)), 16 (asserting that in prior district court proceedings, Patent Owner "never advanced a 'transport layer message header' requirement until after these [*inter partes*] proceedings were filed" (citing Ex. 1005, 396–97; Ex. 1006, 234–36; Ex. 1052, 108:8–24; Ex. 1054, Ex. A, 1, 3)).

Turning to the specification, Petitioner contends that "the '523 patent explains that the Internet Protocol (IP) and conventional networking use the ['Open System Interconnection'] OSI reference model for layers of network protocols." Pet. Prelim. Reply 4 (citing Ex. 1001, 3:24–50 (citing RFC 791)). According further to Petitioner, in OSI network layers, "an IP packet payload may be an entire ['Transmission Control Protocol'] TCP packet including a TCP header and payload." *Id.* (citing Ex. 1011 (RFC 791), 1). The '523 patent refers to using "TLP such as IP." Ex. 1001, 9:6. In the "Summary of the Invention," the '523 patent states "[i]n the OSI reference model the ULP can be thought of as a session layer protocol built on top of a transport or applications layer protocol." *Id.* at 8:37–39. The '523 patent similarly relates ULP and TLP to the OSI model:

> The protocol is called the Upper Level Protocol (ULP) since it is layered above the existing net-work Transport Level Protocol (TLP). In the OSI reference model the protocol can be described as a Session Layer protocol on top of the Transport Layer of the network.

Ex. 1001, 12:46–51.

Petitioner explains further that "OSI network layers are hierarchical—the packet for each layer (containing a header and payload) encapsulates the packets for the layers above: thus, an IP packet payload may contain an entire TCP packet including a TCP header and payload." Reply 13; *see also* Pet. Prelim. Reply 4 (similar explanation). Petitioner contends that testimony in previous proceedings by Dr. Almeroth, Patent Owner's declarant, supports Petitioner. *See* Reply 13–14. As an example, Petitioner provides the following diagram by Dr. Almeroth:

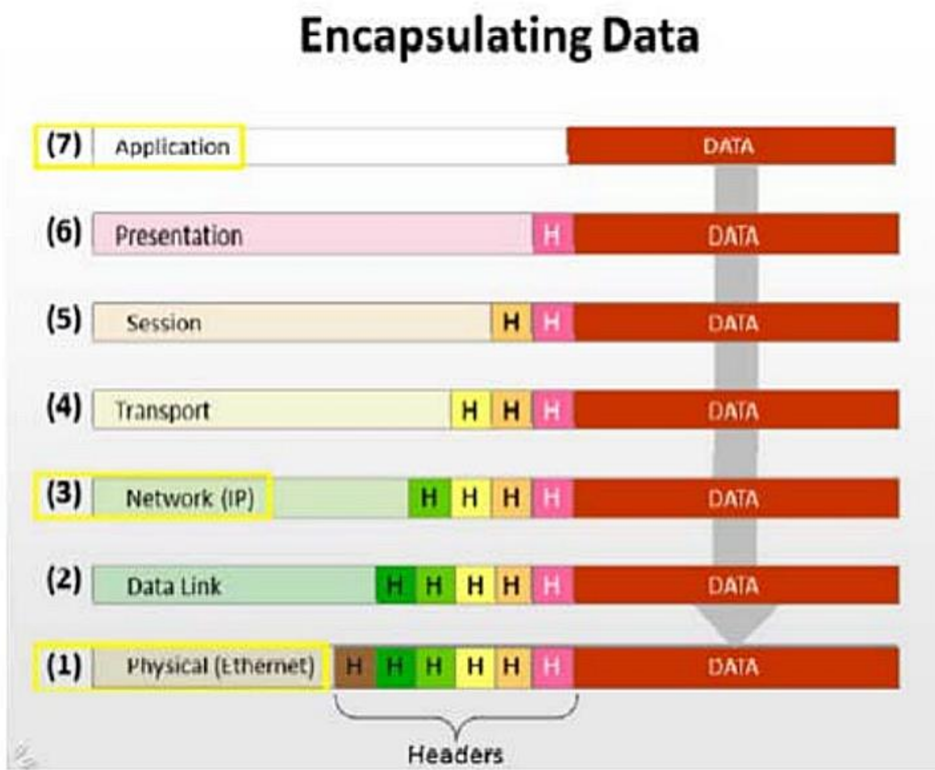


Id. at 14 (reproducing the above figure from Ex. 1056 ¶ 68). The above figure represents encapsulation of higher layers, including TCP segments and headers, as data forming an IP datagram. Dr. Almeroth explains as follows:

> This process of adding a layer header to the data from the preceding layer is sometimes referred to as "encapsulation" *because the data and layer header is treated as the data for the immediately following layer*, which, in turn, adds its own layer header to the data from the preceding layer. Each layer is generally not aware of which portion of the data from the preceding layer constitutes the layer header or the user data; as such, *each layer treats the data it receives from the preceding layer as some generic payload*.

Ex. 1056 ¶ 68 (emphases added).

As another example, Petitioner provides the following diagram submitted by Dr. Almeroth in a declaration in another proceeding:



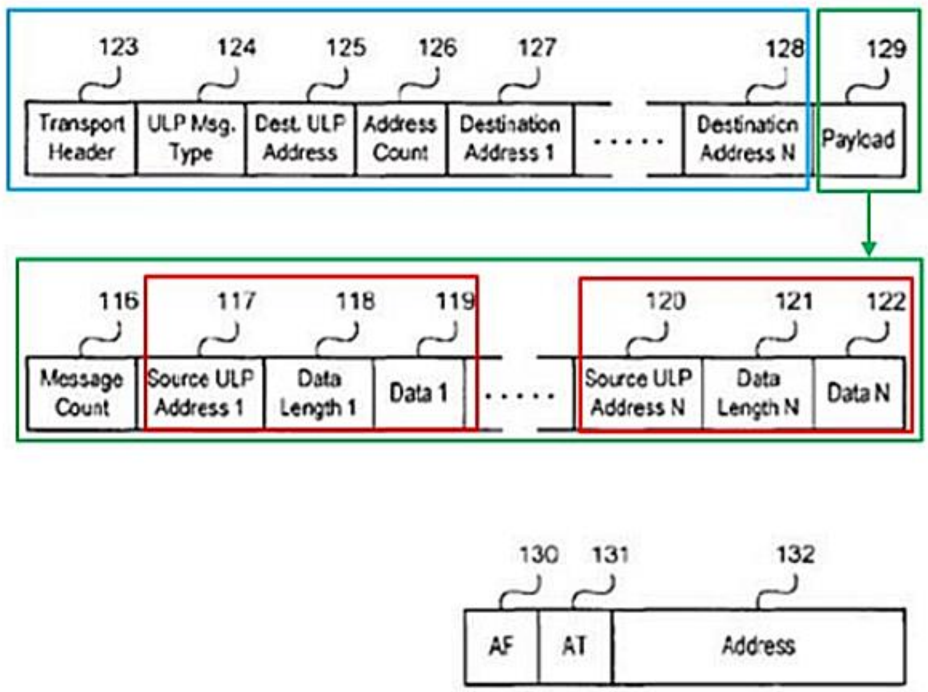
Reply 14 (reproducing the above figure from Ex. 1058 ¶ 56). The above figure, presented by Dr. Almeroth in a declaration for another proceeding, similarly represents encapsulation of headers from upper level layers that lower layers treat as data. *See* Ex. 1058 ¶ 57 ("Encapsulation appends additional headers for other lower level layers in the OSI model to the application layer data. The image above illustrates this by the addition of "H" blocks (i.e., headers) to the left of the application message at each lower OSI level."). In summary, according to Dr. Almeroth, encapsulation using the OSI model involves treating upper level headers and other data as data.

Petitioner also relies on similar teachings in RFC 791, which states that the IP module that a TCP module calls could "take a TCP segment (including the TCP header and user data) as the data portion of an [IP datagram]." Reply 14 (quoting Ex. 1011, 1). As background information, the '523 patent refers to RFC 791 as discussing how TCP "ensures reliable, in order delivery," of packets in the OSI model. *See* Ex. 1001, 3:26–47.

Patent Owner concedes the claims encompass encapsulated headers, as used in the OSI model. *See* PO Resp. 8 ("Patent Owner's construction position is not that the term 'aggregated message' does not encompass encapsulated headers.") (citing Inst. Dec. 13–14)).[8] According to Patent Owner, "Patent Owner's construction is that an 'aggregated message' includes only a **single transport layer message header**." *Id*. at 8–9. Nevertheless, as explained further below and above, and as Patent Owner concedes, the '523 patent supports encapsulating header information as data.

Patent Owner annotates Figure 9 of the '523 patent as follows:

[8] Patent Owner's concession responds to the panel's preliminary determination in the Institution Decision stating "Patent Owner does not dispute, in a clear fashion, Petitioner's contention that the claims may encompass encapsulated headers." Inst. Dec. 13.



PO Resp. 7.

As annotated and described by Patent Owner, Figure 9 shows "the overall structure of an aggregated message includes a message header (blue) a payload (green), and multiple payload elements (red) included as part of an aggregated payload." *Id.* (citing Ex. 1001, 14:37–52). Patent Owner contends "[t]he fields 123, 124, 125, 126, 127 and 128 constitute the message header" with "the transport header 123" of "[a]n upper layer protocol (ULP) message." *Id.* (citing Ex. 2002 ¶ 47).[9] Patent Owner states

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[9] Patent Owner's argument conflates *transport header* 123 and *encapsulated* ULP header portions 124–128. Encapsulated portions 124–128 do not form part of the "message header," contrary to Patent Owner's characterization. The transport layer header 123 constitutes the message header and encapsulates ULP header elements 124–28 and payload portion 129. *See* Ex. 1002, 13:59–66 ("The ULP can be implemented as a datagram protocol by *encapsulating addresses, message type information and the message payload within a datagram of the underlying network transport protocol*. The general form of the ULP datagram message format is shown in FIG. 9 as elements 123, 124, 125, 126, 127, 128 and 129. The transport header 123 is the datagram header of the

"[e]ach of the aggregated payload elements include the source ULP address 117, 120 of the transmitted payload element, the data length 118, 121 of the payload element and the actual data 119, 122." *Id*. at 8 citing (Ex. 1001, 14:37–50).

Patent Owner advanced similar arguments prior to institution, and the panel determined the following:

> As Patent Owner argues, Figure 9 of the specification does not include a TLP header in each payload packet of the aggregated payload. *See* Prelim. Resp. 7–8. Nonetheless, as noted above, headers, such as headers 117 and 118, or 120 and 12[1], appear in each payload. *See* Ex. 1001, 23:11–12 ("Each payload item in a message queue will contain a ULP source address, a data length and the data to be sent."). Even though an embodiment strips out a TLP header from a "message," it also looks up a TLP header of the host from "host address map 137." *Id.* at 23:20–22. The specification consistently shows that a payload, even within an aggregated payload, may contain header fields. *See, e.g., id.* at Fig. 9.

Inst. Dec. 12–13.

Patent Owner does not dispute the preliminary finding set forth in the Institution Decision that "[t]he specification consistently shows that a payload, even within an aggregated payload, may contain header fields." *Id*. at 13; *see* PO Resp. 8–9. Rather, Patent Owner argues that "[t]here is thus no indication in the '523 Patent that multiple TLP headers are included within the aggregated message." PO Resp. 11.

TLP that is *encapsulating the ULP datagram*. The ULP message type field 124 . . . *must be present in a ULP datagram*." (emphases added)); Ex. 1053 ¶¶ 6–8 (describing encapsulated payload and address portions as typical under the OSI, TCP, and IP frameworks and citing Dr. Almeroth's testimony from another proceeding). In any case, the outcome here does not depend on what the disclosed transport header includes in this particular disclosed example of Figure 9.

The record supports the preliminary finding, and the parties agree, that the ’523 patent discloses using a TLP header with a datagram protocol to encapsulate messages and/or payloads that include headers (e.g., address information, message type), as discussed above, and as similarly occurs in the OSI model. *See* Ex. 1001, 13:59–62, 14:37–61, 26:28–45; PO Resp. 8–9; Reply 13–14. As such, and as discussed further below, the ’523 patent generally supports including any type of a header, including TLP headers or other headers in the OSI model, as part of the data portion of encapsulated messages.

Nevertheless, Patent Owner argues that the ’523 patent does not support encapsulated TLP headers because excluding a TLP header creates data reduction according to the ’523 patent. *See* PO Resp. 12 (citing Inst. Dec. 14; Ex. 1001, 24:23–28). Patent Owner repeats the following preliminary finding from the Institution Decision: “The specification describes any data reduction as significant only for small packet sizes, and generally attributes data reductions due to message aggregation.” PO Resp. 12 (quoting Inst. Dec. 14 (citing Ex. 1001, 24:23–28)).

Patent Owner responds to this preliminary finding by arguing as follows:

> The ‘523 Patent however clearly discusses significant data reduction by eliminating transport headers from payloads. The ‘523 Patent states “[a]ggregation will also reduce the total data rate to the hosts **since <u>aggregation eliminates the need for separate message headers for each payload item</u>**. The savings will be significant for small payload items since there will be **<u>only one message header</u>** comprising fields 123, 124 and 125 for multiple payload items.” Ex. 1001, 24:23–28 (emphasis added). The ‘523 Patent also states that an aggregated message is “longer and contains multiple payloads, but this is a significant

> improvement over received multiple messages **with the wasted overhead of multiple message headers** and message processing time." Ex. 1001, 10:40–44.

Id. at 12.

Patent Owner (*id*. at 12–13) and Dr. Almeroth (Ex. 2002 ¶¶ 53–54) focus on reduced *data* rates, but the specification *also* describes savings based on aggregation for all packet sizes based on "greatly reduc[ing] *the total message rate* received by the hosts," because "[a] single message to a host will be able to carry multiple payload items received from the other hosts during the aggregation period." Ex. 1001, 24:12–15 (emphasis added). This shows that savings in *message rate* occurs regardless of whether the data packet portion contains encapsulated header information, because no wasted overhead occurs in treating the encapsulated header data as data. So this *message rate* savings still occurs even if the encapsulated portion of the packet includes TCP or TLP header information, because the system processes that encapsulated header portion as data, as Dr. Almeroth generally explains in prior proceedings as noted above. *See* Ex. 1056 ¶ 68; Ex. 1058 ¶ 56. The '523 patent supports this finding as it recognizes that "[a]ggregation will be very effective in collecting together all of the messages from all of the other hosts into a single message for each member of the group," and "[*t]his reduces processing . . . since a single message will be received rather than many separate messages*." Ex. 1001, 24:18–23 (emphasis added). The specification, therefore, does not limit an aggregated payload or aggregated messages, as claimed, from including encapsulated headers as data in a single aggregated message (which also similarly occurs in the OSI model), including transport layer headers encapsulated within the payload.[10]

Regarding the *data rate*, it will increase if a packet includes more data, as Patent Owner argues. *See* PO Resp. 12. Patent Owner contends that "significant data reduction [occurs] by eliminating transport headers from payloads." *Id*. But as we initially determined in the Institution Decision, and as the specification states, "the savings will be significant [only] *for small payload items* since there will be only one message header comprising fields 123, 124, and 125." Ex. 1001, 24:25–28 (emphasis added); *see* Inst. Dec. 14 (citing Ex. 1001, 24:23–28). As we also noted in the Institution Decision, the challenged claims do not limit the payload size. *See* Inst. Dec. 14. The reduced message rate benefit described above that accrues for a single message occurs regardless of the packet sizes aggregated in the single message. *See* Ex. 1001, 24:18–23. So the specification still confers a message rate benefit without necessarily limiting the claims to cover only small packets based on a small packet data rate benefit. Moreover, Patent Owner does not urge a packet size limitation in its claim construction.

The specification also generally allows for different header and packet types and layers following the OSI model according to the specification.

[10] The Federal Circuit instructs that simply describing alternative features without articulating advantages or disadvantages of each feature cannot support a negative limitation. *Inphi Corp. v. Netlist, Inc.*, 805 F.3d 1350, 1356–57 (Fed. Cir. 2015). To the extent that excluding multiple TLP headers involves the advantage of data reduction, including other header types within the scope of the claim defeats any advantage of excluding a specific type from that scope.

See, e.g., Ex. 1001, 3:41–52, 8:22–37, 12:42–54, 14:37–46, 26:28–45. As an example, the specification refers to a preferred embodiment as specifying "the TLP protocol is TCP/IP," and it states that for aggregated messages, "the [encapsulated] payload will still contain the source host ULP addresses in each [of] the payload items." *Id*. at 26:28–50. In general, however, the specification supports many types of packets, further showing that the broad claims must not be limited to stripping TLP (or TCP) headers from a payload: "The wide area network used to transport the ULP protocol need not be the Internet or based on IP. Other networks with some means for wide area packet or datagram transport are possible including ATM networks or a digital cable television net-work." *Id*. at 27:38–43.[11]

On this record, the '523 specification supports Petitioner's argument that the claim term "aggregated payload," consistent with its ordinary and plain meaning, encompasses a collection of two or more data items that may include headers transported as data. Patent Owner's past claim construction positions support this determination by showing, at the least, prior to this *inter partes* trial, how Patent Owner viewed the meaning of various claim

[11] Petitioner also alleges the '523 patent creates a distinction between layers and levels so that removing a TLP header involves removing a transport level protocol, not a transport layer protocol. *See* Reply 17. As indicated above, the '523 patent refers to "Level" protocols in Upper Level Protocol (ULP) and Transport Level Protocol (TLP), respectively, as associated with a "Session Layer protocol on top of the Transport Layer" of the network in the "OSI reference model." *See* Ex. 1001, 12:46–50; *accord id*. at 8:34–41. The '523 patent also refers to "the OSI reference model for layers of network protocols." *Id*. at 3:27. Our claim construction and holding do not turn on any alleged distinction between level and layer, but we agree with Petitioner that the '523 patent discusses TLP as including either IP or TCP/IP. *See* Reply 17–18.

terms, including terms discussed herein. *See* Ex. 1005, 396–97; Ex. 1006, 234–36; Ex. 1052, 108:8–24; Ex. 1054, Ex. A, 1, 3.[12]

2. "aggregated message"

Patent Owner contends "aggregated message," as recited in claim 1, means "[o]ne or more messages containing a single transport layer message header, destination data, and data items from an aggregated payload." PO Resp. 4. Patent Owner relies on Figure 7 of the specification as providing an example:

> Each of the aggregated messages 100, 101, 102 and 103 received by a host from a server includes the aggregated payloads (Pn_1, Pn_2, Pn_3) in each message and a header portion consisting of a transport layer protocol source address (S) of the server, a transport layer protocol destination address (A, B, C or D) for the destination host and a destination upper layer protocol (ULP) address (H, I, J or K) for the destination host.

Id. at 6 (citing Ex. 1001, 8:1–10:67; Fig. 7).

Patent Owner contends Figure 7 discloses "only a single message header consisting of the transport layer protocol source address, the transport layer protocol destination address and the ULP address." *Id.*

Petitioner contends "[t]he claims provide sufficient guidance on the meaning of '*aggregated payload*' and '*aggregated message*.' They do not support excluding any 'transport layer' headers." Reply 13. Petitioner also

[12] Petitioner notes that Patent Owner did not alter its original claim construction positions during district court litigation even up to about two and a half weeks prior to filing its Preliminary Response here on February 15, 2018, but altered its position to include the transport later requirements after filing the Preliminary Response. *See* Reply 16 (citing Ex. 1054, Ex. A, 1, 3; Ex. 1055, 2–4).

contends Patent Owner's "district court construction of '*aggregating/aggregated*' likewise includes no 'transport layer header' requirement." *Id*. (citing Ex.1055, 2–3). Citing the testimony of Dr. Almeroth from different proceedings as discussed above, Petitioner also points out "OSI network layers are hierarchical—the packet for each layer (containing a header and payload) encapsulates the packets for the layers above: thus, an IP packet payload may contain an entire TCP packet including a TCP header and payload." *Id*. Petitioner also points out that Patent Owner impermissibly relies on a single embodiment to support its "transport layer" header requirement, "where the server removes Transport Level Protocol (TLP) headers from received messages." *Id*. at 15.

As Petitioner contends, the '523 patent supports more than a single embodiment, thereby impacting the breadth of an "aggregated message" (and the related term "aggregated payload"). As determined in the previous section, in addition to supporting OSI packets and datagrams, the '523 patent supports different types of packets and datagrams not limited to a transport layer, for example, "[o]ther networks with some means for wide area packet or datagram transport . . . including ATM networks or a digital cable television net-work." Ex. 1001, 27:38–43. Relying on similar evidence and reasons addressed above regarding an "aggregated payload," Petitioner shows that the specification and evidence supports an "aggregated message" as including an aggregated payload and at least one header in addition to any encapsulated header that may happen to be within the aggregated payload. *See* Reply 12–16; Pet. Prelim. Reply 1–5; Ex. 1016, 93; Ex. 1001, Fig. 9. As an example, the specification shows that a payload may include more than "actual data" 119, for example, "a triplet of source ULP address, data length and data." Ex. 1001, 14:40–46 (discussing items 117, 118, and 119). It also shows that a payload may be "encapsulate[ed]" as a "datagram protocol." *Id*. at 13:59–62; *accord id*. at 26:28–45 ("[T]he [encapsulated] payload will still contain the source host ULP addresses in each [of] the payload items."). Typically, a packet message includes at least one header, and packet bodies may contain encapsulated packets each with their own headers and bodies. *See* Pet. Prelim. Reply 4; Ex. 1016, 93; Ex. 1001, 3:24–52, Fig. 7, Fig. 9; Ex. 1011, 1; Ex. 1056 ¶ 68; Ex. 1058 ¶ 56; Ex. 1046 (PC NETWORKING HANDBOOK (1996)).[13]

For reasons similar to those explained above in construing an "aggregated payload," an "aggregated message" includes a message having an aggregated payload and at least one header in addition to any additional headers that may happen to be within the aggregated payload.

3. "payload portion"

The parties do not challenge our initial claim construction of the term "payload portions" as recited in claim 1. *See* Inst. Dec. 16–17. For the reasons set forth in the Institution Decision and additional reasons similar to those explained above with respect to "aggregated payload" and "aggregated message," and tracking language proposed by Patent Owner in previous litigation, a "payload portion" includes "[t]he part of a message that contains data item(s) conveying information." *See* Ex. 1001, 14:40–42 (discussing

[13] "A packet that contains data and delivery information is a datagram." Ex. 1046, 178. "Packets have two parts: the header and the body." *Id*. at 179. "The header carries information such as the source and destination of a packet." *Id*. "The body is the raw data carried by a packet or, *in many cases, another type of (encapsulate) packet that contains its own header and body*." *Id*. (emphasis added).

items 117, 118, and 119); Ex. 1032 (Joint Claim Construction Statement), 2; Inst. Dec. 16–17.

C. Obviousness Challenges

As indicated above, Petitioner challenges claims 1–10, 16–18, 31–37, 41, 42, and 44–47 as obvious over Aldred and RFC 1692. Petitioner also challenges claims 38–40 as obvious over Aldred, RFC 1692, and RFC 1459, and claim 43 as obvious over Aldred, RFC 1692, and Denzer. Patent Owner raises several arguments in its Response that we address below.

1. Aldred

Aldred, titled "Collaborative Working in a Network," published as an International Application on May 26, 1994, from an application filed on November 10, 1993. Ex. 1009, [54], [43], [22]. Aldred relates to a "programmable workstation for collaborative working in a network," which includes a "collaborative application support subsystem for interfacing with application programs," wherein the subsystem "is responsive to predetermined application program calls to create a logical network model of a collaborative environment" that comprises "sharing sets of application programs, which share data and resources across nodes and logical dedicated data channels connecting members of the sharing set." Ex. 1009, [57].

Figures 3 and 4, reproduced below, show a logical network model that comprises sharing sets of application programs between various nodes.

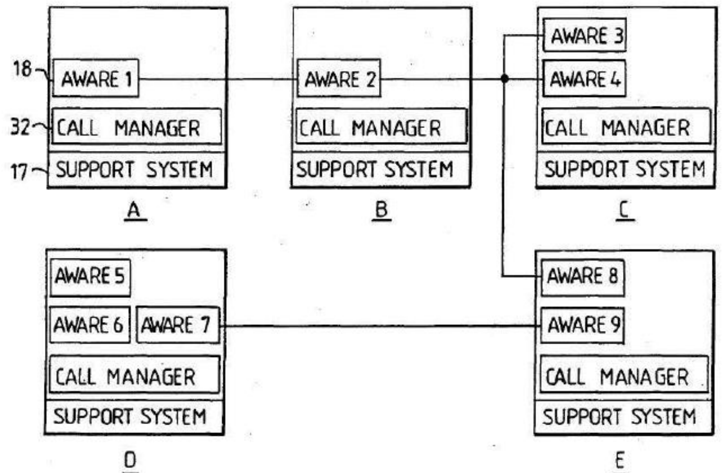

FIG. 3

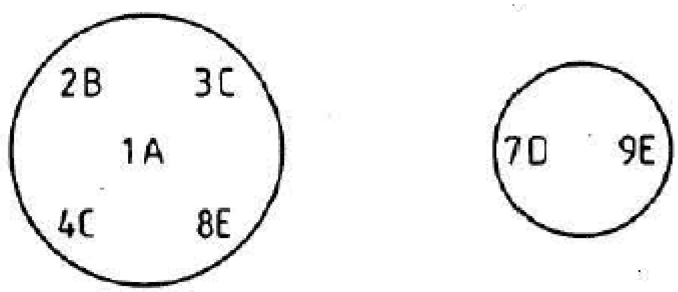

FIG. 4

Figure 3 depicts aware applications sharing data and resources between nodes A, B, C, D, and E. *Id*. at 5–6. Figure 4 depicts the two sharing sets resulting from the sharing of the aware applications in Figure 3. *Id.*

An aware application initiates a share request, naming an application sharing set, a target application and a destination node. *Id.* at 5. Support software passes the request to a call manager at the sending node, which then transfers it to the call manager at the destination node. *Id*. The sharing mechanism can be cascaded; for example, two sharing applications can initiate a share with a third application naming the same sharing set, with the result that all three applications then share with each other. *Id*.

Applications in a sharing set establish data communication links with each other known as channels. *Id.* at 6. As shown in Figures 3 and 4, various channels link applications at nodes A, B, C, and E, and one channel links aware applications at nodes D and E. *See* Figure 3 and 4. In particular, various channels link aware application 1 at node A, aware application 2 at node B, aware applications 3 and 4 at node C, and aware application 8 at node E, which all belong to the same sharing set. One channel links aware application 7 at node D and aware application 9 at node E, which belong to the same sharing set. *Id.*

A serializing channel set feature combines data packets from different channels, and delivers serialized packets to each application such that each receiving port receives the same sequence of data. *Id.* at 7.[14] Through this synchronizing feature, "data packets on separate channels are tied together in time (for example, voice with video), but delivered through the individual ports belonging to the channels." *Id.*

Figure 6, reproduced below, provides an example of a shared drawing board using serializing channel set 59 consisting of channels 57 and 58:

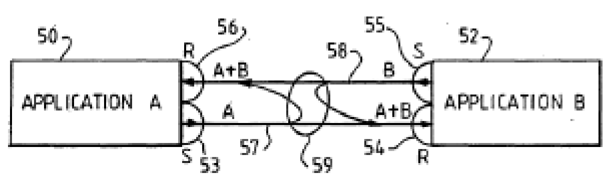

FIG. 6

With respect to Figure 6,

> [t]wo identical applications, A and B (50 and 52), allow their users to draw on a single shared surface. In order that the users

[14] Aldred refers to "serialisation," but unless quoting Aldred or the parties, we refer to "serialization."

> at A and B see identical results, all the drawing orders at A must be sent to B via ports 53 and 54, and vice versa via ports 55 and 56, in such a way that the sequence processed at A and B is identical. This is accomplished by each transmitting their own data both to each other and to themselves, over two channels 57 and 58 which are members of a common serializing channel set 59.

Id. at 7.

Serialization can be implemented at a single central point with all data being sent there for serialization and subsequent distribution. *Id.* at 9. Figure 19, reproduced below, shows the serializing process:

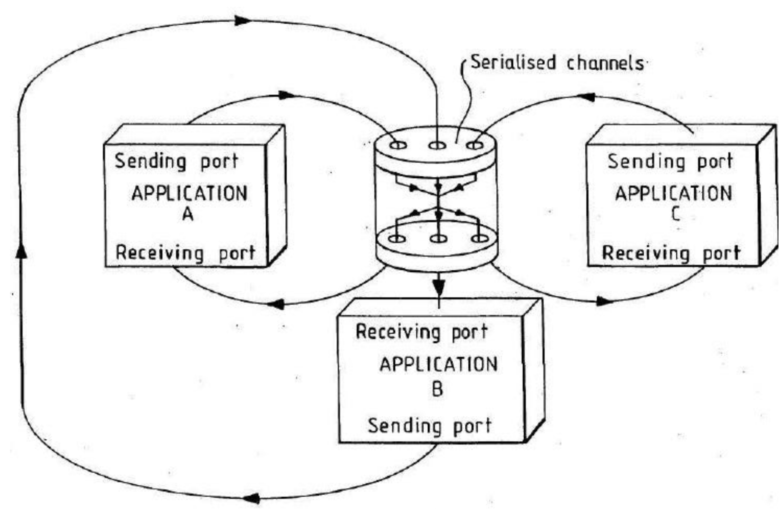

FIG. 19

Figure 19 depicts a collaborative group with established communication between member applications A, B, and C, through various channels. *Id.* at 50. Each member application A, B, C can receive data packets from any of the other members that "arrive at all the receiving ports in the identical sequence." *Id.*

With respect to each application, logical channels consist of a uni-directional data pipe with a sending port at one end and a receiving port at the other. *See id.* With respect to the group, channels include one sending port and many receiving ports. *Id.* (discussing Fig. 15).

To join, a new member participant must "know the application name or an existing member and uses the same channel set name." *Id.* at 50. Thus, participants easily and regularly can join or leave the group. *Id.* at 47.

2. RFC 1692

RFC 1692, titled "Transport Multiplexing Protocol (TMux)" (August, 1994), specifies an Internet standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Ex. 1010, at 1. RFC 1692 discloses a TMux protocol, "which allows multiple short transport segments, independent of application type, to be combined between a server and host pair." *Id*. at Abstract. RFC 1692 recognizes that "the network and host load could be greatly reduced if traffic from multiple users, destined for the same host, could be sent in the same packet." *Id*. at 2. Accordingly, "TMux is designed to improve network utilization and reduce the interrupt load on hosts which conduct multiple sessions involving many short packets," by "multiplexing transport traffic onto a single IP datagram," thereby "resulting in fewer, larger packets." *Id.*

RFC 1692 explains "it is the overhead of processing a packet which consumes a host's resources, not the processing of the data." *Id*. "[T]he work a host must do to process a 1-octet packet is very nearly as much as the work it must do to process a 1500-octet packet." *Id*. "[C]ommunication load is not measured only in bits per seconds but also in packets per seconds," and "the proposed multiplexing is aimed at alleviating this situation" of the "latter" as "the true performance limit" "in many situations." *Id*. The method presents demultiplexed segments of the single

IP datagram to the transport layer "as if they had been received in the usual IP/transport packaging." Id. at 2–3. The "[t]he transport layer is, therefore, unware" of the "special encapsulation" employed in multiplexing "a set of transport segments into the same IP datagram." *Id*. at 2.

In other words, RFC 1692 discloses achieving multiplexing by combining the individual segments into a single message having an IP header followed by encapsulated segments that each include a "TMux mini-header which specifies the segment length and the actual segment transport protocol." *Id.* at 3. RFC 1692 depicts a TMux message as follows:

```
| IP hdr | TM hdr | Tport segment | TM hdr | Tport segment| ...|
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Id. In the TMux message represented above, "TM hdr" represents the mini-header, and "IP hdr" represents the "Internet Protocol (IP) header." *See id*. at 3. RFC 1692 teaches that the disclosed multiplexing scheme involves removing the same IP hdr for each segment: "TMux first removes the IP header (if present) and adds a TMux mini-header and the segment to the Multiplexed Message under construction for the host specified by the destination address of the segment." *Id*. at 6.

> Only segments with the same Internet Protocol (IP) header, (with the possible exception of the protocol and checksum fields) may be combined. For example, the segment (H1, B1) and the segment (H2, B2), where Hi and Bi are the headers and the bodies of the segment, respectively, may be combined (multiplexed) only if H=H1=H2. *The combined TMux message is either (H, B1, B2) or (H, B2, B1)*.

Id. at 3 (emphasis added).

3. RFC 1459

RFC 1459 titled, "Internet Relay Chat Protocol" (May 1993), defines an Experimental Protocol for the Internet community, and requests discussion and suggestions for improvements. Ex. 1025, at 1. RFC 1459 discloses an Internet Relay Chat (IRC) protocol for use with text based conferencing, with IRC representing a teleconferencing system, which (through the use of the client-server model) runs on many machines in a distributed fashion. *Id*. at 4. A typical IRC set up involves a single process (the server) forming a central point for clients (or other servers) to connect to, performing the required message delivery/multiplexing and other functions. *Id*. A channel, i.e., a named group of one or more clients which will all receive messages addressed thereto, is created when the first client joins it and ceases to exist when the last client leaves it. *Id.* at 5.

4. Prior Art Printed Publication Status of RFC 791, RFC 1459, and RFC 1692

Patent Owner does not challenge our initial determination in the Institution Decision that RFC 791 (dated September 1981), RFC 1692 (dated August 1994), and RFC 1459 (dated May 1993), were available to persons of ordinary skill interested in computer networking and security sufficiently to be deemed "publicly accessible" at the relevant time. *See* Inst. Dec. 26–31; *SRI Int'l, Inc. v. Internet Sec. Sys., Inc.*, 511 F.3d 1186, 1194 (Fed. Cir. 2008). For the reasons discussed in the Institution Decision, we maintain our preliminary determination that RFC 791, RFC 1692, and RFC 1459 qualify as prior art printed publications.

5. Independent Claim 1

As indicated above, Petitioner alleges that challenged claims 1–10, 16–18, 31–37, 41, 42, and 44–47 would have been obvious over Aldred and RFC 1692. Pet. 3, 19–59. Petitioner primarily relies on Aldred to teach or suggest all the limitations of independent claim 1. Pet. 19–38. To the extent Aldred does not teach certain limitations of independent claim 1, Petitioner relies on RFC 1692. *Id*. at 28–30, 31–38. Petitioner also relies on the testimony of Dr. White. Ex. 1007; Ex 1053. Patent Owner disputes Petitioner's contentions and relies on the testimony of Dr. Almeroth. PO Resp. 18–32; Ex. 2002.

a. "A method for providing group messages to a plurality of host computers connected over a unicast wide area communication network, comprising the steps of:"

Petitioner asserts the preamble of claim 1, "[a] method for providing group messages . . . comprising the steps of," reads on, *inter alia*, Aldred's disclosure of providing a "broad range of collaborative applications" used by a network of workstations that provide serial data packets to a group of hosts. *See* Pet. 19 (quoting Ex. 1009, 1–2), 19–21 (citing, *e.g.*, Ex. 1009, 16, Figs. 9, 19; Ex. 1007 ¶¶ 91–95). Petitioner explains that Aldred discloses serialization, wherein a serialized channel set "involves the collection of all events in a central point, followed by the broadcast of each event to all the destinations for that event." Pet. 20 (quoting Ex. 1009, 7 (emphasis omitted)). Petitioner also explains that Aldred discloses a collection of applications that group members share as a "Sharing Set" of applications, grouped for communication purposes as a "serialised channel set," providing the example of two users collaborating on a shared drawing board, such that they each see the same sequence of drawing events at the same time. *See id.* at 19–20 (citing Ex. 1009, 5, 27–28, Fig. 6; Ex. 1007 ¶ 92). Petitioner explains further that Aldred "discloses that data serialisation for a Sharing Set can be implemented at a 'single central point' (*i.e.*, a Central Serialisation Point ('CSP') 'with all data being sent there for serialisation and subsequent distribution.'" *Id.* at 20 (quoting Ex. 1009, 9).

Petitioner addresses the "unicast network" as recited in the preamble (and later in the body of claim 1), contending Aldred discloses this limitation via merged and serialized channels that transmit packets from a source to a single destination or as a one-to-many packet/channel configuration. *See id.* at 23–24 (citing Ex. 1009, 51, Fig. 21; Ex. 1007 ¶ 99). Petitioner alternatively contends it would have been obvious to use an IP protocol in Aldred's network, including as suggested by RFC 1692's TMux, as addressed further below. *See id.* at 24 (citing Ex. 1010, 6, 9; Ex. 1007 ¶ 100). As Petitioner notes, the '523 patent states "IP, TCP, and UDP are unicast protocols." Ex. 1001, 4:50–51; Pet. 24.

Based on the foregoing, Petitioner persuasively shows that Aldred discloses the preamble of claim 1. Patent Owner does not address the preamble.[15]

b. "providing a group messaging server coupled to said network, said server communicating with said plurality of host computers using said unicast network and maintaining a list of message groups, each message group containing at least one host computer"

Petitioner reads the group messaging server (GMS) onto Aldred's CSP. Pet. 25 (citing Ex. 1009, 9, 51, Figs. 9, 22). Petitioner points out "<u>Aldred's</u> CSP implements a Sharing Set, which represents a collection of applications that mutually share their data, and 'collect[s] . . . all events' for a sharing set, and then 'broadcast[s] . . . each event to all the destinations for that event.'" *Id.* at 26 (citing Ex. 1009, 5, 7; Ex. 1007 ¶ 105). Petitioner also addresses various functions of a message group server based on a claim construction Patent Owner provided in prior litigation. *Id.* at 25–27.

[15] A preamble does not necessarily limit a claim. On this record, neither party argues whether the preamble limits claim 1 (or any challenged claim).

In addition to citing the IP protocol as an obvious variant as noted above, Petitioner reads the unicast network partially onto Aldred's disclosure of the CSP broadcasting all incoming member messages, after queuing the messages, "to each member of the channel set table associated with the Sharing Set over the network." *Id.* at 27 (citing Ex. 1009, 9, 51, Fig. 22; Ex. 1007 ¶¶ 110–111).

Petitioner reads "maintaining a list of message groups, each message group containing at least one host computer" onto Aldred's disclosure of "a channel set table with . . . the addresses of the receiving ports" (Ex. 1009, 51). *See* Pet. 27 (citing Ex. 1009, 51; Ex. 1007 ¶ 112). To the extent a list requires more than one message group, Petitioner contends Aldred discloses merging serialized channel sets, which implies multiple set tables existed prior to the merge. *Id.* at 28 (citing Ex. 1009, 49–50, Fig. 22; Ex. 1007 ¶ 114). Petitioner also contends an artisan of ordinary skill would have recognized that a logical structure that includes multiple channel sets constitutes a list. *See id.* (citing Ex. 1007 ¶ 114). Petitioner also contends to the extent Aldred does not disclose a list, such a list would have been obvious in order to allow the CSP to support more than one sharing set, and data structure lists were well-known at the time. *See id.* at 29 (citing Ex. 1024, 7:53–60; Ex. 1015, 389; Ex. 1007 ¶ 115).

Based on the foregoing, Petitioner shows persuasively that Aldred discloses or at least suggests the "providing" step. Patent Owner does not address Petitioner's showing.

c. sending, by a plurality of host computers belonging to a first message group, messages to said server via said unicast network, said messages containing a payload portion and a portion for identifying said first message group

Petitioner primarily reads sending the payload portion and identifying portion of a message onto Aldred's disclosure of hosts transmitting packet data over specific channels by identifying the Sharing Set and message groups as part of the packetized message. *See* Pet. 31–32 (citing Ex. 1007 ¶¶ 133–134; Ex. 1009, 26–27, Fig. 3). In particular, Petitioner contends, as shown in Figure 3 of Aldred, "[e]ach node can include different applications that are part of different Sharing Sets." *Id.* at 32 (citing Ex. 1009, Fig. 3 (applications 8–9)). According to Petitioner,

> Aldred also discloses a scenario with users A, B, C, and D, each on a different node, participating in a variety of different and Sharing Sets: (1) users A and B share a video link; (2) users A and C share a chalkboard; (3) users A, B, and D share a document review application; (4) users A and D share a ***different*** chalkboard; and (5) users B and D share a ***different*** voice link.

Id. (citing Ex. 1009, 26–27).

Relying on Dr. White's testimony, Petitioner asserts

> messages communicated between Aldred's nodes in these scenarios "must necessarily identify the specific application sharing set to which they pertain, such as by identifying a specific serialised channel set, or else the receiving node would not be able to determine what actions to perform."

Id. (citing 1007 ¶ 134).

Petitioner alternatively contends, "[t]o the extent one might argue that Aldred does not inherently disclose '*a portion for identifying said [] message group*'" (*id.*), one of ordinary skill in the art would have found it obvious "to modify Aldred's inter-node messages related to Sharing Sets (such as updates/events) to identify [a particular] Sharing Set." *Id*. at 32–33 (citing Ex. 1007 ¶¶ 136–139; Ex. 1009, 26–27, 49–50, Figs. 3, 22; Ex. 1011, 24; Ex. 1013, 6:7–35; Ex. 1023, 14:15–17:19, Abstract; Ex. 1025 ¶¶ 5, 6, 19, 20, 32). Petitioner contends "[t]he motivation for doing so would have been that it would avoid any inconsistency when those messages are received by a node who is a member of more than one Sharing Set, as is described repeatedly in Aldred." *Id.* at 34 (citing Ex. 1009, 26–27, Fig. 3).

Petitioner also contends Aldred at least implies more than one channel set (and/or channel set table, either of which would be part of a list per Petitioner's showing as indicated partly above) to an artisan of ordinary skill, so

> [m]odifying Aldred to explicitly identify the Sharing Set (such as by identifying the channel sets representing such Sharing Sets) that should receive the data would allow Aldred's "single central point" embodiment to support more than one serialisation channel set on the central point, as Aldred suggests.

Id. (citing Ex. 1007 ¶ 138). Petitioner also contends "[a] CSP would need to distinguish between different Sharing Sets when queuing incoming data, each of which would have its own channel set queue and table." *Id.* (citing Ex. 1009, 49–51, Fig. 22; Ex. 1007 ¶¶ 138–138).

Aldred supports Petitioner's showing and indicates that the same application A at port A may be shared by at least two different receiving ports B and D, but initially, it may be shared only with receiving port C. *See* Ex. 1009, 50 (defined in channel set CS1). In other words, application A by itself does not appear to define the various Shared Sets to which that application belongs. In addition, at pages cited by Petitioner, Aldred discloses that to join, a new member must "know[] the application name or an existing member and *uses the same channel set name*." Ex. 1009, 50 (emphasis added). Aldred also discloses employing "a named channel set," with one example as follows: "CSname [SP1, SP2, ... SPn : RP1, RP2, . . . RPn]$_{\text{serialised}}$." *Id.* at 49. These disclosures support Dr. White's testimony relied upon by Petitioner. For example, Dr. White testifies "messages communicated between Aldred's nodes to send data to a sharing set must necessarily identify the specific application sharing set to which they pertain, such as by *identifying a specific serialised channel set,* or else the receiving node would not be able to determine what actions to perform." Ex. 1007 ¶ 134 (emphasis added).

Based on the foregoing, Petitioner shows persuasively that Aldred discloses or at least suggests the "sending" step, including using packet portions wherein packets identify groups in order to provide and track serialized messages to multiple message groups. Patent Owner does not address Petitioner's showing regarding the "sending" step.

d. "aggregating, by said server in a time interval determined in accordance with a predefined criterion, said payload portions of said messages to create an aggregated payload"

Petitioner reads the aggregating limitation onto Aldred's disclosure of the CSP sending data packets over channels, "where each packet is added to a queue and then serially transmitted to each member of the Sharing Set associated with the serialised channel set." Pet. 35 (citing Ex. 1009, 9, 51, Fig. 22; Ex. 1007 ¶ 142). To the extent Aldred's aggregation may not be explicit, Petitioner relies on the combined teachings of Aldred and RFC 1692 as suggesting the claimed "*aggregating*" step obvious. *Id*. at 35–40 (citing Ex. 1009, 2–4, 7, 9, 28–30, Fig. 10; Ex. 1010, 1–3, 6, 10; Ex. 1007 ¶¶ 143–151).

In particular, Petitioner relies on RFC 1692 for teaching "an improvement on the Internet Protocol called the Transport Multiplexing Protocol (TMux)," which "allows multiple short transport segments, independent of application type, to be combined between a server and host pair" (*id.* at 35–36 (quoting Ex. 1010, 1)), wherein the "network and host load could be greatly reduced if traffic from multiple users, destined for the same host, could be sent in the same packet" (*id.* at 36 (quoting Ex. 1010, 2)). Petitioner adds "TMux is designed to improve network utilization and reduce the interrupt load on hosts which conduct multiple sessions involving many short packets . . . by multiplexing transport traffic onto a single IP datagram," thereby "resulting in fewer, larger packets." *Id.* at 36 (quoting Ex. 1010, 2). According further to Petitioner, in TMux, "[t]he multiplexed packet comprises an IP header followed by one or more TMux mini-headers that specify respective transport segments (*i.e.*, the original payloads)." *Id.* (citing Ex, 1010, 3; Ex. 1007 ¶ 143). Petitioner also asserts that RFC 1692 "explains that multiplexed messages are constructed using a timer, and outgoing packets are added to a multiplexed message until the timer expires." *Id.* at 40 (citing Ex. 1010, 6; Ex. 1007 ¶ 152).

Petitioner asserts that "RFC 1692 provides abundant motivation to incorporate TMux into Aldred." *Id.* at 38. Petitioner, as noted, indicates that one benefit includes greatly reduced traffic by combining traffic from multiple users destined for the same user into one packet. *Id.* (citing Ex. 1010, 2). Petitioner contends "[t]he TMux protocol is intended to optimize the transmission of large numbers of small data packets" and "is designed to improve network utilization and reduce the interrupt load on hosts which conduct multiple sessions involving many short packets." *Id.* at 38 (quoting Ex. 1010, 2; citing Ex. 1007 ¶ 147).

Petitioner also contends "TMux is an extension of the Internet Protocol (IP)," wherein, "[i]ncorporating the TMux protocol into Aldred would simply involve using the TMux-enhanced IP protocol for Aldred's transport mechanism, something well-within the abilities of an Ordinary Artisan." *Id*. at 38–39 (citing Ex. 1007 ¶ 149). Petitioner points out that Aldred describes IP as having "many benefits." *Id.* at 38 (quoting Ex. 1009, 4). Petitioner also points out that Aldred "supports 'TCP/IP,'" by referring to "TCP/IP LSM 229" and "its exemplary networking [support] software, IBM NetBIOS." *Id*. at 37 (citing Ex. 1009, 2–3, 28–29, Fig. 10; Ex. 1017). In addition, Petitioner points out "Aldred explicitly suggests performing '[d]ata *multiplexing … below the application*,' which '*can be implemented in different ways depending upon the underlying transport mechanism*.'" *Id*. at 38 (quoting Ex. 1009, 30 (emphasis added)), thereby suggesting "us[ing] the TMux-enhanced IP protocol for Aldred's transport mechanism, something well-within the abilities of an Ordinary Artisan." *Id*. at 39 (citing Ex. 1007 ¶ 149).

In response, Patent Owner asserts "Petitioner's analysis has provided an insufficient basis for the combination of Aldred and RFC 1692 due to its failure to consider the effects of several key factors." PO Resp. 15. As the assertion indicates, Patent Owner raises a number of arguments alleging deficiencies in Petitioner's showing regarding motivation. We address Patent Owner's arguments about an alleged lack of motivation in a separate section below.

Patent Owner also contends "RFC 1692 only discloses combining separate *messages* together as a TMuxed message; RFC 1692 does not disclose aggregating *payload portions* to create an *aggregated payload*." PO Resp. 33 (citing Ex. 1010, 2–8; Ex. 2002 ¶ 98). According to Patent Owner, RFC 1692 discloses a number of transport headers, each designated as "Tport segment" and each also including a TMux mini-header. *Id*. at 34 (citing Ex. 1010, 3). Patent Owner explains "the Tport segments do not merely comprise aggregated payload portions as defined by the claims of the '523 Patent, but further include the transport headers from the originally received message." *Id*. at 34.

Therefore, according to Patent Owner, the combined teachings of Aldred and RFC 1692 do not teach or suggest an "aggregated payload" under Patent Owner's proposed construction; namely, "a collection of two or more data items that does not include transport layer headers." *Id*. at 33. Also, Patent Owner contends claim 1 "requires a two-step process," as follows: "in a first step, aggregating payload portions of messages to create an aggregated payload, and, in a second step, forming an aggregated message using said aggregated payload." *Id*. at 37. According to Patent Owner, "[t]he creation of the aggregated message involves adding the transport and IP headers (123–128) to the aggregated payload (116–122) to create the aggregated message." *Id.* at 39.

Patent Owner's arguments do not undermine Petitioner's showing because we do not adopt Patent Owner's proposed claim construction. *See supra* Section II.A.1.2. In line with our claim construction, the claim term "*aggregated payload*," consistent with its ordinary and plain meaning in light of the specification, encompasses "a collection of two or more data items that may include headers transported as data." *Supra* Section II.A.1. Patent Owner does not dispute that the challenged claims cover encapsulated header information (e.g., addresses). *See* PO Resp. 8 ("Patent Owner's construction position is not that the term 'aggregated message' does not encompass encapsulated headers."). As Dr. Almeroth testified in another proceeding, the "process of adding a layer header to the data from the preceding layer is sometimes referred to as 'encapsulation' *because the data and layer header is treated as the data for the immediately following layer*, which, in turn, adds its own layer header to the data from the preceding layer." Ex. 1056 ¶ 68 (emphasis added). According to RFC 1692, and as quoted by Patent Owner, the TMux message involves "special encapsulation" of the underlying transport segments. PO Resp. 36 (quoting Ex. 1010, 2–3). Patent Owner agrees that RFC 1692's TMux process involves encapsulation. *See* PO Resp. 47 (arguing the transport segments "still have data, addresses, and transport headers encapsulated therein, such that they can be transported and processed in accordance with the transport layer").

In addition, the TMux message includes a single IP header (IP hdr) "equal to H," so the process strips out the IP header H for at least some of the segments (H, B1), (H, B2), (H, Bi) prior to combining them, and then combines (i.e., multiplexes) the two segments into aggregated packets having the TMux structure "(H, B1, B2) or (H, B2, B1)," "where Hi and Bi are the headers and the bodies of the segment, respectively." Ex. 1010, 3. In other words, "TMux first removes the IP header (if present) and adds a TMux mini-header and the segment to the Multiplexed Message under construction." *Id*. at 6. So the TMux process involves at least two steps, similar to the two disclosed steps of the '523 patent (as characterized by Patent Owner (PO Resp. 39)), and it involves encapsulation in which the system treats the bodies B1 and B2 (which include mini-headers) as data relative to the single IP header H and IP layer. *See* Ex. 1010, 3, 6.

Petitioner also points out the '523 patent states "***the TLP protocol is TCP/IP***" and "refers to a 'TCP/IP header' as a single header" (Reply 17–18 (quoting Ex. 1001, 26:28–29, 41–42) (emphasis by Petitioner)), so "removing a TLP header encompasses removing the ***IP header alone***." *Id.* at 18. In a similar fashion, the TMux process "first removes the IP header (if present)" and then combines body Bn portions of different messages. *See* Ex. 1010, 3, 6. Therefore, even if we adopt Patent Owner's construction, "[a]s explained in the Petition and by Dr. White, Aldred in view of RFC 1692 results in an '*aggregated payload*' without any ***IP*** headers and an '*aggregated message*' with a single ***IP*** header." Reply 18 (citing Pet. 36–38; Ex. 1007 ¶¶ 68–76, 143; Ex. 1053 ¶ 34).

In its Sur-Reply, addressing Petitioner's argument that "Aldred 'encourages multiplexing at lower layers—the very technique to which RFC 1692 is directed'" (Sur-Reply 5 (quoting Reply 9)), Patent Owner contends Petitioner takes Aldred's "statement . . . out of context."[16] *Id.* (citing Ex. 1009, 5). According to Patent Owner, "[m]ultiplexing ***in Aldred*** refers to the 'separation of data traffic,' such that 'voice, video and data traffic . . . can be sent over multiple channels' so that 'data components are presented

[16] The Petition similarly argues "Aldred explicitly suggests performing *'[d]ata multiplexin*g . . . below the application'" (Pet 40 (quoting Ex. 1009, 30) (emphasis added)) and therefore suggests "us[ing] the TMux-enhanced IP protocol for Aldred's transport mechanism" (*id.* (citing Ex. 1007 ¶ 149)).

individually.'" *Id*. (quoting Ex. 1009, 30). Therefore, according to Patent Owner, "Aldred does ***not*** encourage the same technique to which RFC 1692 is directed – combining multiple messages into a single message for transmission." *Id.*

This argument mischaracterizes Aldred's teachings. Aldred describes "separation of data traffic into logical . . . flows of homogeneous data" so that "[d]ata multiplexing is handled below the application and can be implemented in different ways depending on the underlying transport mechanism," including, as an example, by "multiplexing all the data in the support layer." *See* Ex. 1009, 30. Contrary to Patent Owner's arguments, an artisan of ordinary skill would have understood that multiplexing in Aldred and RFC 1692 involves *combining* data units or packets—the opposite of separating. *See* Ex. 1010, 3 ("The TMux Protocol is defined to allow the *combining of transmission units* of different higher level protocols in one transmission unit of a lower level protocol." (emphasis added)). Also, in Aldred, even if data separation occurs prior to multiplexing, this supports Petitioner's small packet theory, in which the claims embrace small packets disclosed by Aldred and multiplexed by RFC 1602, because the flow of small packet data from a chalkboard application in Aldred would be separated from, for example, larger video packets. *See* Ex. 1053 ¶ 26 ("An Ordinary Artisan would understand the 'chalkboard' application can send only small messages and the 'file transfer' or 'voice/video link' applications can send only larger messages.").

Patent Owner also argues the '523 patent "teaches aggregating payload portions of messages into an aggregated payload that does not include original transport layer headers, and forming a single aggregated message that includes a single transport layer header on top of the aggregated payload." PO Resp. 41 (citing Ex. 2002 ¶ 112). Patent Owner explains this provides a benefit of reducing the "total data rate," a "**significant**" savings "for small payload" items, because "there will be only **one message header** comprising fields 123, 124 and 125 for multiple payload items." *Id*. (quoting Ex. 1001, 24:23–28; Ex. 2002 ¶ 113). Patent Owner also argues "[t]he '523 Patent also states that an aggregated message is 'longer and contains multiple payloads, but this is a significant improvement over received multiple messages **with the wasted overhead of multiple message headers and message processing time**." *Id*. (quoting Ex. 1001, 10:40–44 (emphasis by Patent Owner)).

These arguments fail because they largely rest on, or attempt to support, Patent Owner's proposed claim construction, which we do not adopt for the reasons outlined above. *Supra* Section II.A.1–2. As indicated in the claim construction section, the challenged claims do not recite a small packet size, the specification does not limit the claims to a small packet size, and savings in overhead occurs regardless of the layer employed to encapsulate packets (*see id*.) as RFC 1692 also teaches and as explained further next. In other words, pursuing similar arguments, Patent Owner also argues that, in contrast to the disclosed invention, RFC 1692 "retains the overhead of processing each transport layer header . . . requiring that the receiving host demultiplex the combined message and present each original message that includes its original transport header to the transport layer for individual processing." *Id*. at 41–42 (citing Ex. 2002 ¶ 114). These arguments ignore the direct teachings in RFC 1692 describing significant savings for small packets based on reduced overhead:

> TMux is designed to improve network utilization and reduce the interrupt load on hosts which conduct multiple sessions involving many short packets. It does this by multiplexing transport traffic onto a single IP datagram . . . , thereby resulting in fewer, larger packets. TMux is highly constrained in its method of accomplishing this task, seeking simplicity rather than sophistication.

Ex. 1010, 2; *see also id*. at 1 ("TMux can improve both network and host performance."), 2 ("[T]he network and host load could be greatly reduced if traffic from multiple users, destined for the same host, could be sent in the same packet."). So TMux provides one of the same major benefits touted by the '523 patent specification, and included within the breadth of our claim construction, namely a reduction in overhead by creating a single packet out of multiple encapsulated packets. Even if a receiver eventually must process each header at the transport layer, as Patent Owner argues occurs in the TMux system, the TMux system involves processing one IP header at the IP layer in a "single message," (Ex. 1010, 3), leaving the encapsulated remainder for other layers, analogous to the '523 patent. *See id*. at 1–2 ("TMux operates by placing a set of transport segments into the same IP datagram" and uses "special encapsulation").

Based on the foregoing, and after consideration of Patent Owner's remaining arguments addressed below (*see infra* Section II.C.5.g), we determine Petitioner shows that the combination of Aldred and RFC 1692 would have suggested the claimed "aggregating" step, including aggregating packet portions using a well-known TMux protocol in order to allow hosts to process a message of several packet messages with a single IP header instead of individually processing many message packets individually header by header.

e. "forming an aggregated message using said aggregated payload"

Petitioner reads the forming step onto the combined process of Aldred and RFC 1692 such that RFC 1692 suggests employing the TMux functionality, part of which includes adding mini-headers to packets and forming a message with a single IP header while using a timer to aggregate the packets. *See* Pet. 40 (citing Ex. 1010, 3, 6; Ex. 1007 ¶ 155).

Patent Owner contends RFC 1692 discloses "creating a message including combined *messages* with multiple transport layer message headers." PO Resp. 42. Patent Owner also contends "the '523 Patent describes the formed aggregated message as comprising a message that has only a single message header that is combined with aggregated payload items." *Id*. at 43. Patent Owner also argues "the TMux protocol of RFC 1692, rather than forming a message containing an aggregated payload as recited in Claim 1 of the '523 Patent, instead describes a message including combined messages." *Id*. at 47.

Patent Owner's arguments attempt to create a distinction between combining message portions and packet payload portions. However, Patent Owner does not specify any distinction and none appears clear in the context of the challenged claims on this record. Claim 1 recites "said messages containing a payload portion and a portion for identifying said first message group." It does not recite a specific header portion as part of a message, and it does not specify what part of a message the payload portion includes. Figure 6 of the '523 shows a message from Host A, with header portions A (TLP source address A), S (TLP destination address S), G (designating implicit ULP address for Group G), in addition to a payload portion P1 that itself "contains both the data to be sent and the source ULP address H of the host." Ex. 1001, 9:8–13. Claim 1 does not require disclosed elements A, S, or H of Figure 6. Rather, claim 1 only recites 1) "a payload portion" (without requiring "the source ULP address H" as described per Figure 6), and 2) "a portion for identifying said first message group" (e.g., G). *See id.*; *supra* Section I.C. So combining the message body portions of RFC 1692 includes "aggregating . . . payload portions" of messages, according to Petitioner's showing and claim 1, because body portions of messages include payload portions, even if payload portions include header information. *See supra* Section II.B.2 & note 13; Ex. 1009, 3 ("Hi and Bi are the headers and the bodies of the segment.").

Patent Owner acknowledges that payload portions include several items other than actual data. For example, Patent Owner refers to the aggregated message of Figure 9 and describes "payload 129 [green]" that includes "message count 116" and "multiple payload elements [red]," and each payload element includes more than "actual data," i.e., each payload includes "the source ULP address 117 of the transmitted payload element, the data length 118 of the payload element and the actual data 119." PO Resp. 45–46 (citing Ex. 1001, 13:1–14:69, Fig. 9; Ex. 2002 ¶¶ 116–120). Patent Owner describes the TMux protocol of RFC 1692 as describing "a message of combined [encapsulated] messages":

> The Tport segments comprise individual messages which may be separately transported to a destination after they are broken up from a received combination of messages as described with respect to the TMux protocol. *Id.* After breaking them up, they still have data, addresses, and transport headers *encapsulated therein*, such that they can be transported and processed in accordance with the transport layer.

Id. at 47 (emphasis added).

Patent Owner's description shows that the '523 patent describes combining different "payloads," each of which includes ULP address and data length header information, similar to the process of TMux, which according to Patent Owner, includes "data, addresses, and transport headers *encapsulated therein." See id*. (emphasis added). In other words, the packet messages combined in the TMux protocol include packet payloads with additional header information "encapsulated therein" (*id*.) i.e., using "special encapsulation," as Patent Owner recognizes (*id*. 46 (quoting Ex. 1010, 2–3).

In any case, Aldred's messages, like those of the TMux protocol, come in packet form and include payloads, and as described above, the '523 patent's disclosed system combines more than "actual data" in a payload. *See* Ex. 1001, 14:40–46 ("A single payload element consists of a triplet of source ULP address [117], data length [118], and data [119]," where "item 119 is the actual data"); Ex. 1009, 7 (describing "data packets"), 64 (disclosing TCP/IP), 16 ("Data is sent over channels by applications in packets; at the physical level the unit of data transmission is a frame.") According to RFC 1692, "[t]he TMux protocol is intended to optimize the transmission of large numbers of small *data packets*." Ex. 1010, 1 (emphasis added). "It does this by multiplexing transport traffic onto a single IP datagram [2], *thereby resulting in fewer, larger packets*." *Id*. at 2 (emphasis added). A packet payload, or body, typically may include "another type of (encapsulate[d]) packet." *See* Ex. 1046 (PC NETWORKING HANDBOOK (1996)); *supra* note 13.

In addition, the '523 patent generally refers to aggregating the "contents of messages." Ex. 1001, [57] ("Rather than simply forward each message to its targeted hosts, the group messaging server *aggregates the* *contents of each of messages* received during a specified time period and then sends an aggregated message to the targeted hosts." (emphasis added)). The '523 patent also states "[a] key concept in the present invention is the *aggregation of multiple messages* in a message queue into a single ULP receive message to a host that contains multiple payload items in the payload." *Id.* at 23:50–52 (emphasis added). Claim 1 recites "aggregating . . . said payload portions" and "forming an aggregated message using said aggregated payload." As discussed above, claim 1 does not restrict a payload from containing multiple items, including address information, and it does not restrict the process from combining message portions that contain payloads to create an aggregated message of aggregated payloads. *See* Ex. 1001, [57], 14:40–46. As noted, the '523 patent generally allows "aggregate[ing] the contents of . . . messages," wherein aggregating messages also includes aggregating payload items. *See id*. [57]. By removing the IP header of packet segments, TMux involves aggregating payload items as called for by the challenged claims in light of the '523 specification. *See* Ex. 1010, 6 ("TMux first removes the IP header (if present).").

Patent Owner also does not rebut Petitioner's position that RFC 1692 suggests the forming step in order to provide efficiency by processing, at the intended recipient host, an intended message containing multiple packets addressed to that host. *See* Pet. 40 (relying on reasons for the combination in its previous discussion of the aggregating step), 38 (arguing RFC 1692 provides "abundant motivation" including as follows: "The TMux protocol is intended to optimize the transmission of large numbers of small data packets," and "is designed to improve network utilization and reduce the interrupt load on hosts which conduct multiple sessions involving many short packets." (quoting Ex. 1010, 2)); Ex. 1010, 2 (disclosing a "reduced" "network and host load," by sending "fewer, larger packets" "destined for the same host"). As RFC 1692 teaches, "it is the overhead of processing a packet which consumes a host's resources, not the processing of the data." Ex. 1010, 2.

Finally, although not necessary to our holding, Patent Owner concedes that the combination of Aldred and RFC 1692 satisfies "aggregating . . . said payload portions" and "forming an aggregated message using said aggregated payload," when applying multiplexing to small packet applications as the references fairly suggest. *See* Tr. 58:3–5 ("If they're all small, right, if all the messages are small as it goes through, they're all going to be grabbed and multiplexed. That is – that's not an issue if they're small. . . . And so, we took this and we said, well, what if they're large?"), 57:56 ("So, all messages have to be small in order for an aggregated payload with said payload portions multiplexed.").[17]

[17] Patent Owner also argued during the Oral Hearing that the Petition does not raise "the TCP aspect." *See* Tr. 58:16–18; *see also id*. at 56:15 ("That's why we didn't consider TCP/IP."); 53:19–20 ("[T]here's nothing [in the Petition] that says that TCP is an issue, you don't have to consider TCP or segments or anything else. You don't have to consider it, *so we didn't consider it in our original* [Response]." (emphasis added)); *id*. at 57:16–20 ("No, the argument I'm making is that TCP's not important to this argument. We – they've claimed that we knew about TCP, that Aldred was TCP, that by definition, they were small. But, their argument is not in the original petition. The original petition is not that TCP makes them small, their argument is, a, the packages are -- the messages are small."). Contrary to this argument that the Reply raises a new TCP issue, in addition to relying on small packets, as noted above and further below, the Petition refers to Aldred as further suggesting multiplexing where both Aldred and RFC

Based on the foregoing, Petitioner shows that the combination of Aldred and RFC 1692 suggests the claimed "forming" step. As noted in the previous section, Patent Owner also generally asserts "Petitioner's analysis has provided an insufficient basis for the combination of Aldred and RFC 1692 due to its failure to consider the effects of several key factors." PO Resp. 15. We address Patent Owner's arguments about motivation below. *See infra* Section II.C.5.g.

f. "transmitting, by said server via said unicast network, said aggregated message to a recipient host computer belonging to said first message group"

Petitioner persuasively explains that Aldred, as combined with RFC 1692's TMux functionality in the manner discussed above, meets this claim limitation:

> Aldred's serialised channel set maintains "a serialising queue for the channel in which the data items to be serialised are loaded from the sending ports and held in the order in which it is desired to transmit them to all receiving ports." Ex. 1009, 51. As combined above with RFC 1692 (§VI.A.i.e), these messages are multiplexed via TMux before transmission. Ex. 1010, 6. Aldred's serialisation functionality then transmits the data from the serialising queue (in this case a multiplexed message of that data) to each receiving application in the Sharing Set ("*message group*"). *Id*., 7, 51, Fig. 22; Ex. 1007, ¶158.

Pet. 41. In other words, Petitioner persuasively shows that TMux creates a single message with a single IP header by multiplexing the data packets of Aldred destined for a recipient computer host of a message group, thereby

discuss TCP: "Aldred also supports 'TCP/IP,' [Ex. 1009, 28–29], Fig. 10, ('TCP/IP LSM 229'); *see id.*, 3, and its exemplary networking software, IBM NetBIOS, could support TCP/IP. *Id.*, 2–3; Ex. 1017." Pet. 37; *see also id*. at 36–39 (discussing the connection between RFC 1692, Aldred, small packets, payload portions, multiplexing, and TCP).

gaining efficiency by reducing the message rate, as explained above. Patent Owner does not challenge Petitioner's showing regarding this "transmitting" step.

g. Patent Owner's Arguments on Motivation

As indicated above, Patent Owner argues Petitioner fails to articulate sufficient motivation to combine the references. Patent Owner provides several arguments regarding motivation, as addressed below.

i. Small Packets

Patent Owner contends Petitioner relies impermissibly on an assumption that Aldred discloses or suggests small packets to support the alleged motivation for combining the references. *See* PO Resp. 15–17. For example, Patent Owner contends "Petitioner's alleged motivation for this combination is based on its small packet centric argument that RFC 1692 provides benefits for systems generating a number of small packets and '[a]n Ordinary Artisan would have understood that Aldred's system could likewise produce the small packets that would benefit from RFC 1692's multiplexing.'" *Id*. at 17 (quoting Pet. 37). Patent Owner contends Aldred discloses "the possibility of large packets in the serialisation process" and "large packets should not be multiplexed and immediately transmitted." *Id*. at 18 (emphasis omitted).

In Reply, Petitioner persuasively contends, "neither the challenged claims nor Aldred require 'large' packets; both encompass scenarios where ***only*** small packets are generated." Reply 7 (citing Ex. 1007 ¶ 146; Ex. 2004, 43:15–25; Ex. 1053 ¶¶ 26–27). As an example, Petitioner points to Aldred's disclosure of "a broad spectrum of collaborative applications" (Ex. 1009, 1–2) including a shared drawing board application (*id*. at 7) and a chat program where "each participant sees all the exchanged messages, and in the same sequence" (*id*. at 27–28). *See* Reply 7–8 (quoting or citing Ex. 1009, 1–2, 7, 27–28). Dr. White describes these Aldred applications as involving small packets that RFC 1692's method would have improved by reducing the number of Aldred's small packets. Ex. 1007 ¶ 146.

As Petitioner persuasively argues, Patent Owner's "'large' packet scenario does not show nonobviousness when the claims and Aldred's disclosure encompass systems that use only small packets." Reply 8. Patent Owner agrees that Aldred discloses "all sizes of packets." PO Resp. 29. Because RFC 1692 discloses a benefit of reducing the packet rate by combining small packets into a single message packet, similar to the benefit touted by the '523 patent, as discussed above (*see supra* Sections II.A.1, B.5.d), an artisan of ordinary skill would have combined at least its small packet multiplexing teachings with applications in Aldred that employ small packets.

ii. Latency

Patent Owner contends using TMux with Aldred's system "would introduce additional latency into the system," because TMux would delay packets, and therefore be incompatible with Aldred's "alternative bandwidth solutions." *See* PO Resp. 18–19, 29–30 (citing Ex. 2002 ¶ 84). Patent Owner contends that these alternative solutions, which include "'throughput, latency, jitter, packet size, packe[]t error rate, encryption, compression hints, [and] priority,'" "allow data transmission characteristics to be tailored to the requirements of the expected traffic" and show that Aldred's system "expect[s] to handle all sizes of packets, not just small packets." *Id*. at 29 (citing Ex. 2002 ¶ 82; quoting Ex. 1009, 18). Dr. Almeroth's testimony tracks Patent Owner's arguments. *See* Ex. 2002 ¶ 84 (discussing latency due to a timer in RFC 1692).

Petitioner persuasively replies "the techniques proposed by RFC 1692 were complementary to the techniques discussed in Aldred," because "[a]s Dr. White explained, when there is a high-volume of small packets and high data redundancy, TMux and compression are 'both obvious things to do' and '[y]ou can use them both at the same time. They're not exclusive.'" Reply 9 (quoting Ex. 2004, 54:21–55:20; citing Ex. 1053 ¶ 33). Patent Owner's arguments and Dr. Almeroth's testimony ignore the fact that Aldred discloses using compression, multiplexing, and other quality of service parameters, and mentions "time-out parameters" on the same page (Ex. 1009, 18), thereby suggesting the compatibility thereof. *See id*. (arguing "Aldred actually *encourages* multiplexing at lower layers" (citing Ex. 1009, 32)); Ex. 1009, 18.

Patent Owner's arguments also support Petitioner's position that Aldred contemplates "all sizes of packets" (PO Resp. 29) for certain applications, including small packets. To the extent multiplexing may increase latency, RFC 1692 discloses an efficiency gain by reducing the total number of packets transmitted, increasing the number of "packets per second," so that multiplexing small packets "should be obvious." *See* Ex. 1010, 2 ("If one assumes that most users connected to a terminal server will be connecting to only a few hosts, *then it should be obvious that the network and host load could be greatly reduced if traffic from multiple users, destined for the same host, could be sent in the same packet*." (emphasis added)). By reducing the packets per second, this implies at least a mitigation of, or trade-off with, any latency. *See* Ex. 1053 ¶ 36 (noting latency and other parameters can be "balanced" against the benefits of RFC 1692). In any event, as Dr. White explains, quality of service (QoS) parameters (e.g., latency) "can be 'tailored' to each application's needs" (citing Ex. 1009, 6), and "[f]urther, Aldred does not require specifying any particular QoS parameter." Ex. 1053 ¶ 35 ("An application ***can*** specify quality of service characteristics when creating a channel . . . ." (quoting Ex. 1009 18) (emphasis by Dr. White)). Moreover, the challenged claims do not require a reduced latency or any specific QoS parameter.

iii. Order

Patent Owner argues Aldred's system maintains order. *See* PO Resp. 20 (arguing Aldred's "data packets are combined, serialized and transmitted in a same sequence to all targets." (citing Ex. 2002 ¶ 68)). Patent Owner contends RFC 1692's system sends "large packets right away, thereby causing them to arrive out of order." *Id*. Consequently, Patent Owner argues combining Aldred and RFC 1692 to implement RFC 1692's multiplexing system would not have been obvious. *See id*. at 20–21.

In similar arguments, Patent Owner also argues "[l]arge packets were . . . ignored by Petitioner and Petitioner's expert." *Id*. at 22. In another section, Patent Owner advances other arguments that turn on its theory that Aldred discloses large packet sizes or both large and small packet sizes. *See* PO Resp. 23–28. For example, Patent Owner argues "Petitioner has also failed to consider the effect of larger packets on the packet order of the CSP of Aldred if the TMux protocol is included." *Id*. at 23 (citing Ex. 2002 ¶¶ 71–72). Patent Owner also argues "[s]ince Aldred discloses scenarios that include transmitting a combination of large and small packets, Petitioner does not provide an adequate demonstration of why a POSITA would have been motivated to combine Aldred and RFC 1692." *Id*. at 28.

These arguments and testimony unpersuasively turn on limiting Aldred's disclosure to applications that include large packet sizes. As found and determined above, Aldred's system contemplates small packet applications, and RFC 1692 discloses an efficiency gain by reducing the total number of small packets transmitted, increasing the "packets per second," so that multiplexing "should be obvious." *See* Ex. 1010, 2 ("If one assumes that most users connected to a terminal server will be connecting to only a few hosts, *then it should be obvious that the network and host load could be greatly reduced if traffic from multiple users, destined for the same host, could be sent in the same packet*." (emphasis added)); Ex. 1007 ¶ 146 ("One of ordinary skill in the art would have understood that drawing orders and other events used to keep data consistent between applications [in Aldred], such as user input, would result in messages significantly smaller than the IP protocol supports, such that <u>RFC 1692's</u> methodology would improve <u>Aldred's</u> performance by reducing the number of packets."). Dr. Almeroth's testimony tracks Patent Owner's arguments and does not contradict Dr. White's testimony that Aldred discloses small packet applications, because Dr. Almeroth only points out that Aldred discloses some examples (e.g., video) of "data packets much larger than the drawing orders of Aldred [that] Petitioner uses as an example." *See* Ex. 2002 ¶ 70. Patent Owner does not dispute that the challenged claims include small packets within their breadth. Accordingly, Patent Owner's arguments that rely on large packets (*see, e.g., id*. at 20–28) are not commensurate in scope with the claims.

Further regarding order, Patent Owner argues "RFC 1692 does not discuss the order of packets to be TMuxed as being a concern, or the order in which packets can be sent relative to the order in which they are generated." PO Resp. 20. Petitioner persuasively replies "Aldred's channel mechanism *maintains* the order of updates within a channel regardless of the underlying layers." Reply 5 (citing Ex.1053 ¶ 25). Petitioner persuasively relies on the following teachings in Aldred and testimony by Dr. White:

> Channels are designed so that a node "receives data packets from the channel in the order in which they were sent," ***regardless*** of the "physical communication network in existence between the nodes." Ex. 1009, 6, 29–30. Aldred's channels therefore maintain the order of data packets within a given channel. Ex.1009, 6, 51. As Dr. White explains, "Aldred provides an order guarantee at the logical channel level, regardless of the underlying networking scheme." Ex.1053, ¶25. PalTalk argues that transmitting TCP segments out-of-order would break this functionality, but fails to address Aldred's disclosure that order is maintained regardless of the physical network's implementation. Resp. 21–28; Ex. 2002 ¶¶ 73–79.

Reply 5.

In its Sur-Reply, Patent Owner notes that Petitioner adds the word "regardless" before the above-quoted passage in Aldred about the "physical communications network." *See* Sur-Reply 3 (citing Reply 5; Ex. 1009, 6). But Patent Owner does not argue clearly that Petitioner mischaracterizes Aldred. *See id*. Rather, Patent Owner simply points out that Aldred "*actually* states '[t]here may be no direct mapping between the logical channel structure seen by the aware applications and the physical communication network in existence between the nodes' – i.e., the application ports in Aldred are connected by separate, logical, channels." *Id*. at 3 (quoting Ex. 1009, 6). This line of argument does not undermine

Petitioner's position. Patent Owner does not dispute Petitioner's point or Dr. White's testimony (as quoted above) that the logical channels in Aldred guarantee order. *See* Reply 5; Ex. 1053 ¶ 25. Rather, Patent Owner summarizes its position by, again, relying on its large packet argument. Sur-Reply 3 (arguing "smaller items would be removed from the serialization queue and added to the TMux buffer, and larger segments would be transmitted immediately"); *see also id*. at 3–4 (similar large packet arguments based on FTP segments, the expiration of the TMux timer, and larger packet segments not being multiplexed).

In other words, after demultiplexing, to the extent TMux does not maintain packet order, the higher level channel logical channel layer in Aldred maintains packet order. *See* Ex. 1009, 6 (defining a channel "by the sending application" and "with application specified transmission characteristics," and stating "a receiving port . . . receives data packets from the channel in the order in which they were sent").[18] As Petitioner also explains, Aldred discloses using TCP/IP, with RFC 1692 extending TCP/IP to IP. Reply 6 (citing Ex. 1009, 29–30, Fig. 10; Ex. 1010, 4–8, 10; Ex. 1007 ¶¶ 143–148). At the cited pages, RFC 1692 discloses "allocat[ing] the traffic appropriately to the underlying transport network" (Ex. 1009, 29), and states "[d]ata multiplexing is handled below the application (*id*. at 30). *See id*. at Fig. 10 (disclosing TCP/IP).

[18] In addition, the '523 patent states that although UDP does not guarantee "in-order delivery" of application datagrams of a data stream, TCP "handles division of the stream into packets and ensures reliable, in-order delivery." *See* Ex. 1001, 3:25–47.

g. Summary, Independent Claim 1

Based on the foregoing and a review of the record, Petitioner demonstrates that the combination of Aldred and RFC 1692 would have rendered claim 1 obvious. *See* Pet. 19–40.

6. Dependent Claims 2–10, 16–18, 31–37, and 44–47.

Claims 2, 3, 7 and 8 recite similar "time interval" limitations. Claim 2 recites "[t]he method of claim 1 wherein said time interval is a fixed period of time." Claim 3 recites "[t]he method of claim 1 wherein said time interval corresponds to a time for said server to receive at least one message from each host computer belonging to said first message group." Claim 7 recites "[t]he method of claim 1, wherein said time interval is between 33 ms and 200 ms." Claim 8 recites "[t]he method of claim 1, wherein said aggregating is performed 5 to 30 times a second." Claim 8, therefore, defines the time interval of 1/5 seconds to 1/30 seconds, or, 20 to 30 milliseconds.

Relying partly on its showing for claim 1 as discussed above, Petitioner contends RFC 1692 teaches constructing multiplexed messages using a configurable timer that ranges from "20 to 30 milliseconds" up to $1/10^{th}$ of a second (or 100 milliseconds). *See* Pet. 41–42, 48–49 (citing Ex. 1010, 6; Ex. 1007 ¶ 212). Petitioner explains that RFC 1692's system employs a timer to fill up a packet prior to timing out. *See id*. at 41–42. Petitioner contends it would have been obvious to employ the time range interval suggested by RFC 1692's timer in order to form aggregated messages and provide the reduced packet rate benefits disclosed by RFC 1692, as discussed above and further below. *See id.* at 41–43, 48–49 (Petitioner citing its showing regarding aggregating as supplying reasons for the timer range). At the cited page, RFC 1692 states that using the timer ensures that "all segments available for sending before the timer expires are sent in a single Multiplexed Message." Ex. 1010, 6. RFC 1692 also explains "[t]he time period should be large enough to give a reasonable probability of sending multiple segments but not so large that the echo response time becomes a problem." *Id.*

Claim 6 recites "[t]he method of claim 1 wherein said network is Internet and said server communicates with said plurality of host computers using a session layer protocol." Claim 32 recites "[t]he method of claim 1, wherein said sending and said transmitting are performed by an upper-level protocol implemented above a transport layer protocol of said unicast network, wherein said transport layer protocol is TCP/IP."

Addressing claim 6 and relying partly on the showing for claim 32, Petitioner contends an artisan of ordinary skill would understand Aldred's scheme to constitute a session layer protocol (i.e., an upper layer protocol), because, *inter alia*, Aldred teaches handling application/session layers above the transport layer. *See* Pet. 47–48 (citing, *e.g.*, Ex. 1007 ¶ 172; Ex. 1017, 1328). Petitioner explains that Aldred teaches "[d]ata multiplexing is handled ***below*** the application and can be implemented in different ways depending upon the underlying transport mechanism." *Id.* at 48 (quoting Ex. 1009, 30). Petitioner also explains as follows:

> In the OSI context, the application and "*session layer(s)*" are above the transport layer. Ex. 1017; Ex. 1007, ¶¶172, 174. An Ordinary Artisan would understand this to refer to the Aldred's application layer being "on top of the transport layer protocol," Ex. 1007, ¶174, further evidence that Aldred's CSP "*communicates with said plurality of host computers using a*

> *session layer protocol*." This is consistent with Patent's Owner identified construction in District Court. Ex. 1016, 94.

Pet. 48.

Further regarding claim 32, as noted, Petitioner refers to its showing with respect to claim 6. Pet. 52–53. Building on its explanation for claim 6, Petitioner adds the following:

> Aldred's scheme is implemented on top of the underlying transport layer ("*upper-level protocol implemented above a transport layer protocol*"). Ex. 1017, 1338; Ex. 1007, ¶¶172–174. It would have been obvious to combine Aldred and RFC 1692 as expressed above. *See* § VI.A.i.e. The transport protocol used by the nodes in Aldred would therefore be RFC 1692's TMux-enhanced IP protocol, which uses TCP/IP ("*wherein said transport layer protocol is TCP/IP*"). *See* Ex. 1010, 6–7; Ex. 1007, ¶180.

Pet. 53.

Claim 33 recites "[t]he method of claim 1, wherein said sending and said transmitting are performed by an upper-protocol implemented above a transport layer protocol of said unicast network, wherein said plurality of host computers are unable to send upper-level protocol messages to one another except through said group messaging server."

Petitioner relies partly on its showing with respect to claims 6 and 32 and contends Aldred discloses or renders obvious this additional limitation of claim 33. *See* Pet. 53–56. Under one rationale, Petitioner explains that in Aldred's scheme, the hosts send all the data (including application data) to the CSP, which performs a serialization process, so that this shows "*host computers are unable to send upper-level protocol messages to one another except through said group messaging server*." *See id.* at 53–54 (citing Ex. 1009, 9; Ex. 1007 ¶ 184). Under a related but separate rationale, Petitioner explains that Aldred at least suggests using the CSP at a central node in a well-known star topology, so that all data must go through such a CSP. *See* Pet. 54–56 (citing, *e.g.*, Ex. 1031, 1:60–63; Ex. 1012, Fig. 8; Ex. 1009, Fig. 3; Ex. 1007 ¶¶ 186–188).

Figures 17–19 of Aldred support Petitioner's showing, as they depict centrally located CSPs with serialized channels, and all data passes through the CSP from each host. *See* Pet. 14 (annotating Figure 19 and quoting Ex. 1009, 9 ("Serialisation can be implemented at a single central point with all data being sent there for serialisation and subsequent distribution . . . .")); *id*. at 30 (relying on a similar showing to reach the sending limitation of claim 1).

Claim 4 recites "[t]he method of claim 1 further comprising the step of creating, by one of said plurality of host computers, said first message group by sending a first control message to said server via said unicast network." Claim 5 recites "[t]he method of claim 4 further comprising the step of joining, by some of said plurality of host computers, said first message group by sending control messages via said unicast network to said server specifying said first message group." Claim 16 recites "[t]he method of claim 1, wherein membership of said first message group changes over time based on control messages received from ones of said plurality of host computers." Claim 17 recites "[t]he method of claim 1, wherein membership of said first message group changes over time based on indications received from ones of said plurality of host computers to join or leave said first message group." Claim 34 recites "[t]he method of claim 1, further comprising the steps of: said server receiving, from one of said plurality of host computers, a control message to create said first message group; and creating said first message group in response to receiving said control message." Claim 35 recites "[t]he method of claim 1, further comprising the steps of: said server receiving, from a first host computer of said plurality of host computers, a control message to join said first message group; and adding said first host computer to said first message group in response to receiving said request." Claim 36 recites "[t]he method of claim 1, further comprising the steps of: said server receiving, from a first host computer of said plurality of host computers, a control message to leave said first message group; and removing said first host computer from said first message group in response to receiving said request." Claim 37 recites "[t]he method of claim 1, further comprising the steps of: said server receiving a control message to close said first message group; and removing said first message group in response to receiving said request." Claim 41 recites "[t]he method of claim 1, further comprising the steps of: said server receiving, from a first host computer of said plurality of host computers, a control message to connect to said group messaging server; and storing information regarding said first host computer in response to receiving said control message." Claim 42 recites "[t]he method of claim 1, further comprising the steps of: said server receiving, from a first host computer of said plurality of host computers, a control message to disconnect from said group messaging server; and removing information regarding said first host computer in response to receiving said control message."

Petitioner cites to Aldred as disclosing the added elements of claims 4, 5, 16, 17, 34–37, 41, and 42. *See* Pet. 43–45, 50–51, 56–57. As explained by Petitioner, Aldred discloses that nodes join or create a sharing set by sending a "share_app" request to another workstation or node, and leave a sharing set by sending an "unshare_app" request, which amounts to groups changing membership over time, leaving a group, connecting to a server, and receiving and providing a control message, as generally required by claims 4, 5, 16, 17, 34–37, 41, and 42. *See* Ex. 1009, 15; Pet. 43–45, 50–51, 56–57. As Petitioner shows, after a "share_app" request, "both the target and the source join a new sharing set." *See* Ex. 1009, 15. Petitioner also argues that "an Ordinary Artisan" would understand that members or groups leave a sharing set "once the last application in a Sharing Set issues an 'unshare_app' request." Pet. 57 (citing Ex. 1009, 8–9, 15, and 49–51).

Addressing claims 4, 5, 16, 17, 34–37, and 42, Patent Owner responds that the claims require a server to perform the recited functions. *See* PO Resp. 52. Patent Owner explains as follows:

> Aldred does not disclose that 'share_app' or 'unshare_app' requests are sent to a CSP in order for a node/application to create, join, or leave a sharing set. Aldred also does not disclose that in response to a received 'share_app' request, the CSP adds nodes to the sharing set, removes nodes from the sharing set, or stores or removes information regarding the nodes.

Id. at 53. Patent Owner advances similar arguments contending that Aldred's CSP does not act as a "<u>server</u>" that performs the functions recited in claims 4, 5, 16, 17, 34–37, and 41. *Id*. at 53–54.

Contrary to Patent Owner's arguments, claims 16 and 17 do not recite a server. Regarding claims 4, 5, 34–37, and 41, which recite a server, Patent Owner's arguments do not undermine Petitioner's showing, which relies partly on Exhibit 1009 at page 9 and Figure 19 as disclosing a single CSP central point through which all data to be serialized passes, and which also, or alternatively, relies on the obviousness of using such a scheme in a well-known star network or otherwise. *See* Pet. 43, 45, 51–57. Regarding obviousness, for example, Petitioner explains that using a CSP as a central node server would have reduced latency based on its position between other nodes. *See* Pet. 54–55 (citing Ex. 1007 ¶ 187).

As Petitioner also explains,

> Aldred's CSP has a central role in maintaining communications for Sharing Sets that utilize serialized channels. Aldred's serialization is maintained through a channel set table on the CSP. Ex. 1009, 9, 51. Aldred implements the serialization process via "a channel set table with the addresses of all receiving ports" and a "serialising queue for the channel in which the data items to be serialised are loaded from the sending ports and held in the order in which it is desired to transmit them to all receiving ports." *Id.*, 51. In Aldred's CSP embodiment, this serialization is performed on a central point, illustrated in Figure 9. *Id.*, Fig. 9. "New members may easily be added to the group with the necessary data channels being established and serialised automatically by the underlying system." *Id.*, 50.

Reply 23.

Petitioner also relies on the testimony of Dr. White, who characterizes Aldred's CSP as a server, and testifies "this 'single central point' would be located as part of the support system of one of the participating nodes." Ex. 1007 ¶ 94; *see* Reply 23–24 (citing Ex. 1007 ¶¶ 94–95); Pet. 44 ("The CSP ('server'/'group messaging server') is included on one of the nodes included in the shared application, so would likewise receive this initial 'share_app' request." (citing Ex. 1007 ¶ 294)). Dr. White relies on Figure 2 of Aldred, supplemented by Aldred's statement that "[s]erialisation can be implemented at a single central point with all data being sent there for serialisation and subsequent distribution." Ex. 1007 ¶ 94 (quoting Ex. 1009, 9; reproducing *id*. at Fig. 2). Dr. White also relies on Figure 9 of Aldred, and contends an artisan of ordinary skill would understand Figure 9 to represent a system node interface to applications. *See id*. ¶ 95. Accordingly, the record supports Petitioner's contention that the CSP of Aldred constitutes or at least suggests a server that performs the functions of claims 4, 5, 16, 17, 34–37, and 41, and in addition, the functions in other claims reciting a server (e.g., claims 5, 6, 33, and 42). *See* Pet. 43–45, 53–57.

Based on the foregoing discussion and a review of the record, Petitioner shows persuasively that the combination of Aldred and RFC 1692 renders obvious claims 2–8, 16, 17, 32–37, and 42. In addition to its arguments and evidence regarding claims 2–8, 16–17, 32–37, and 42 summarized above, Petitioner provides explanations and supporting evidence demonstrating persuasively that the combination of Aldred and RFC 1692 renders obvious claims 9, 10, 18, 31, 41, 42, and 44–47. *See* Pet. 44, 48–52, 57–59. As part of that showing, Petitioner explains persuasively that a person of ordinary skill in the art would have had a sufficient reason to combine or modify the teachings of the references. *See id.* We adopt Petitioner's showing as our own. Patent Owner does not challenge Petitioner's showing with respect to claims 2, 3, 6–10, 18, 31–33, and 44–47 with particularity. *See* PO Resp. 54–57 (relying on arguments presented with respect to claim 1). Based on the foregoing discussion, Petitioner demonstrates persuasively that the combination of Aldred and RFC 1692 would have rendered claims 2–10, 16–18, 31–37, 41, 42, and 44–47 obvious.

6. Remaining Challenged Claims 38–40 and 43

Petitioner provides explanations and supporting evidence explaining persuasively how the combination of Aldred, RFC 1692, and RFC 1459 would have rendered claims 38–40 obvious, and how the combination of Aldred, RFC 1692, and Denzer would have rendered claim 43 obvious. *See* Pet. 59–69. Petitioner relies partially on Aldred's "query_channel_set" and the testimony of Dr. White, and persuasively shows that a person of ordinary skill in the art would have had a sufficient reason to combine or modify the teachings of the references, including querying groups and obtaining a list to obtain current status information without burdening the system, and including providing compression to reduce packet sizes. *See id.* We adopt Petitioner's showing as our own. Patent Owner does not challenge the showing with respect to these claims with particularity other than relying on its arguments with respect to claim 1. *See* PO Resp. 57–59 (relying on arguments presented with respect to claim 1 and stating RFC 1459 and Denzer do not cure the alleged deficiencies asserted with respect to claim 1).

III. CONCLUSION

For the foregoing reasons and based on a review of the record, we determine that Petitioner has shown by a preponderance of evidence that claims 1–10, 16–18, 31–37, 41, 42, and 44–47 would have been obvious over Aldred and RFC 1692; claims 38–40 would have been obvious over Aldred, RFC 1692, and RFC 1459; and claim 43 would have been obvious over Aldred, RFC 1692, and Denzer.

IV. ORDER

For the reasons given, it is

ORDERED that claims 1–10, 16–18, and 31–47 of the '523 patent are unpatentable; and

FURTHER ORDERED that because this is a final written decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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CERTIFICATE OF SERVICE

I hereby certify that the original of this Notice of Appeal was filed via U.S.P.S. Priority Mail Express on June 12, 2019 with the Director of the United States Patent and Trademark Office at the address below:

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